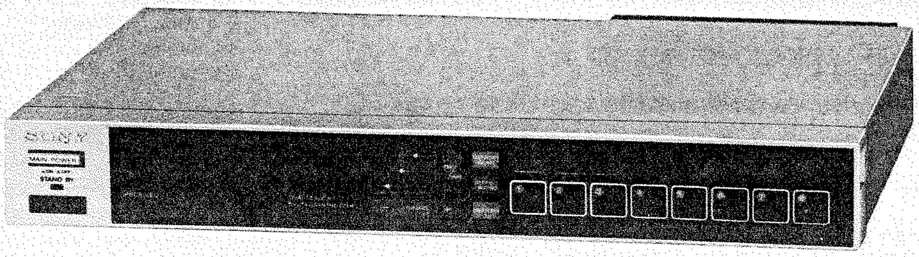
ST-V7

US Model
E Model



FM STEREO/FM-AM SYSTEM CONTROL TUNER

SPECIFICATIONS

FM tuner section

Tuning range	87.5 MHz - 108 MHz
Antenna terminals	300 ohms, balanced 75 ohms, unbalanced
Intermediate frequency	10.7 MHz

Sensitivity	at 50 dB quieting 16.1 dBf, 3.5 μV (mono) 37.9 dBf, 43 μV (stereo)
Usable sensitivity	10.3 dBf, 1.8 μV (IHF)
Signal-to-noise ratio	84 dB (mono) 78 dB (stereo)
Harmonic distortion at 1 kHz	0.08% (mono) 0.15% (stereo)
IM distortion	0.08% (mono) 0.15% (stereo)
Separation at 1 kHz	50 dB
Frequency response	30 Hz – 15 kHz $^{+0.5}_{-2.0}$ dB

Selectivity	at 400 kHz 80 dB
Capture ratio	1.0 dB
AM suppression ratio	60 dB
Image response ratio	80 dB
IF response ratio	90 dB
Spurious response ratio	100 dB
RF intermodulation	74 dB (IHF)
Sub-carrier product ratio	65 dB
Muting threshold	approx. 25 dBf,
Output level/ impedance	at 75 kHz deviation 750 mV, 4.7 k ohms

— Continued on page 2 —

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY®

SERVICE MANUAL

AM tuner section

Tuning range	522 - 1,602 kHz (with the AM channel plan selector set at 9 kHz) 530 - 1,610 kHz (with the AM channel plan selector set at 10 kHz)
Antenna	Ferrite-bar antenna External antenna terminal
Intermediate frequency	450 kHz
Usable sensitivity	46 dB/m, ferrite-bar antenna (at 999 or 1,000 kHz) 30 μV, external antenna (at 999 or 1,000 kHz)
Signal-to-noise ratio	55 dB
Harmonic distortion	0.3%
Selectivity	35 dB (9 kHz), 38 dB (10 kHz)
Image response ratio	45 dB (at 999 or 1,000 kHz)

General

System	PLL quartz-locked digital synthesizer system
Power requirements	US model: 120 Vac, 60 Hz 120V-E model: 120 Vac, 50/60 Hz 220V-E model: 220–240 Vac, 50/60 Hz
Power consumption	US model: 17 watts E model: 18 watts
AC outlet	1 switches, 500 watts max
Dimensions	Approx. 355 × 55 × 270 mm (w/h/d) (14 × 2 1/8 × 10 5/8 inches) including projecting parts and controls
Weight	US model: Approx. 3 kg (6 lbs 10 oz) net E model: Approx. 3.1 kg (6 lbs 14 oz) net

FEATURES

The quartz-locked digital frequency-synthesizer system allows accurate and stable tuning that is not affected by temperature variations or long period usage.

Quick and accurate station selection is possible with an electronic digital readout on the frequency display window.
Two methods of tuning are available:
Manual tuning, in which each band can be scanned either rapidly or step-by-step.
Memory preset tuning, in which the frequency of up to eight stations can be stored in the memory. Various reception conditions can also be memorized for each station to permit one-touch reception.

The MEMORY SCAN key allows you to scan automatically the preset stations only, listening to each one for a few seconds to check if there is anything you would like to listen to.

The supplied remote commander allows you to control all components connected to the tuner remotely.

The memory contents are retained by a lithium manganese battery incorporated in the tuner when the power is turned off. This battery also allows the last station tuned in to be held in the memory.

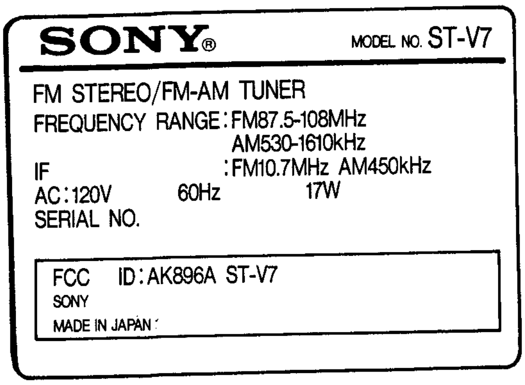
The three-step LED signal strength indicator provides an easy readout of the received signal strength.

An FM muting circuit is incorporated to eliminate any interstation noise. The setting of the STEREO/MUTING key can also be memorized for each station, and permits one-touch reception with a suitable mode/FM muting setting.

MODEL IDENTIFICATION

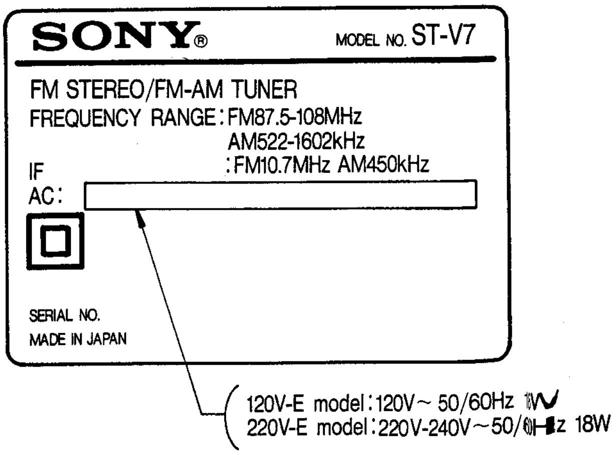
— Specification Label —

- **US model**



SONY® MODEL NO. ST-V7
FM STEREO/FM-AM TUNER
FREQUENCY RANGE: FM87.5-108MHz
AM530-1610kHz
IF :FM10.7MHz AM450kHz
AC:120V 60Hz 17W
SERIAL NO.
FCC ID:AK896A ST-V7
SONY
MADE IN JAPAN

- **120V-E model, 220V-E model**



SONY® MODEL NO. ST-V7
FM STEREO/FM-AM TUNER
FREQUENCY RANGE: FM87.5-108MHz
AM522-1602kHz
IF :FM10.7MHz AM450kHz
AC:
SERIAL NO.
MADE IN JAPAN

120V-E model: 120V~ 50/60Hz 18W
220V-E model: 220V-240V~50/60Hz 18W

SAFETY CHECK-OUT (US Model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

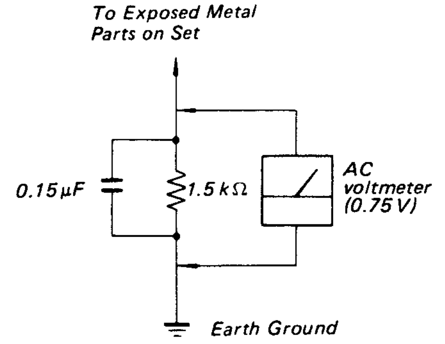
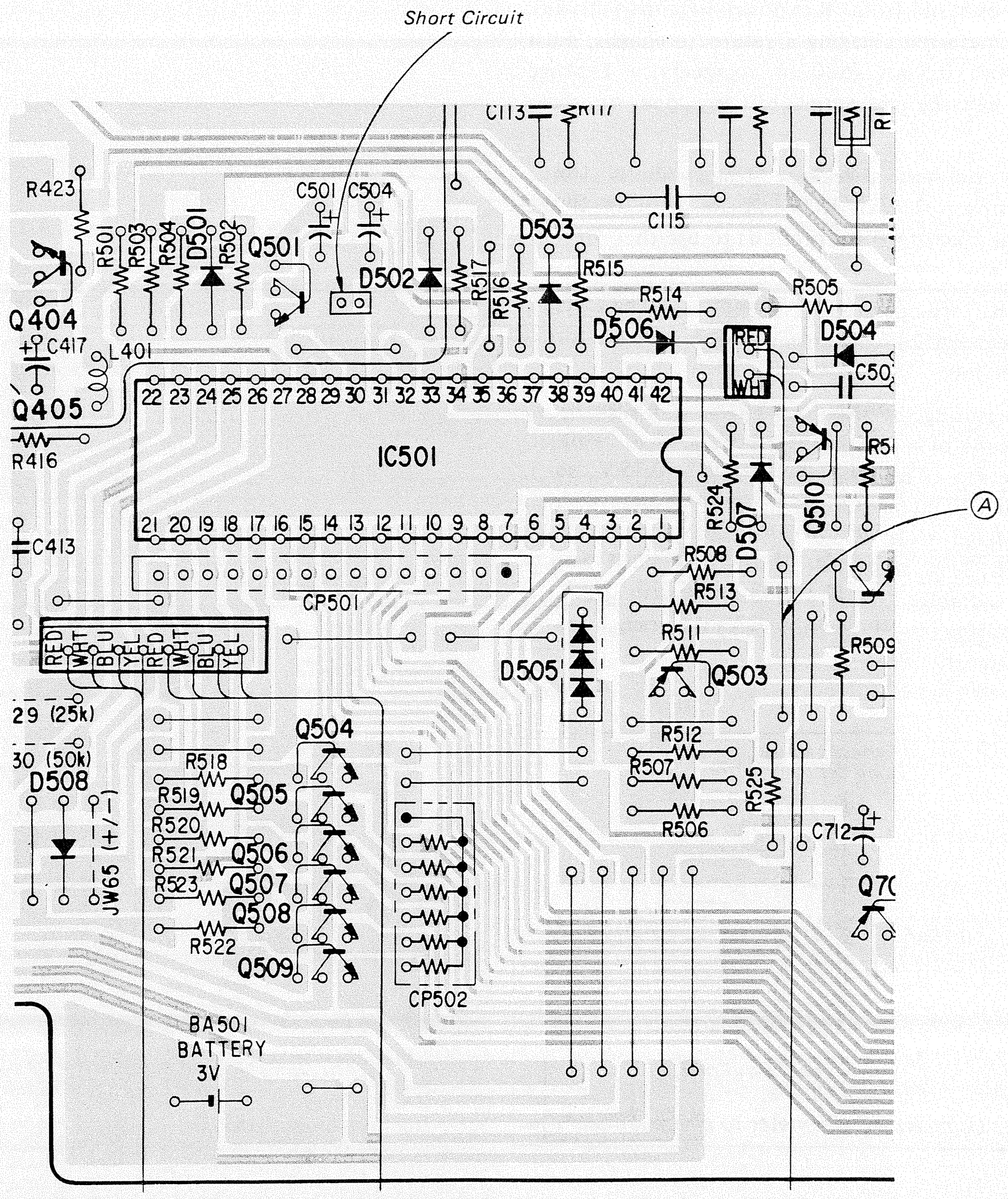


Fig. A. Using an AC voltmeter to check AC leakage.

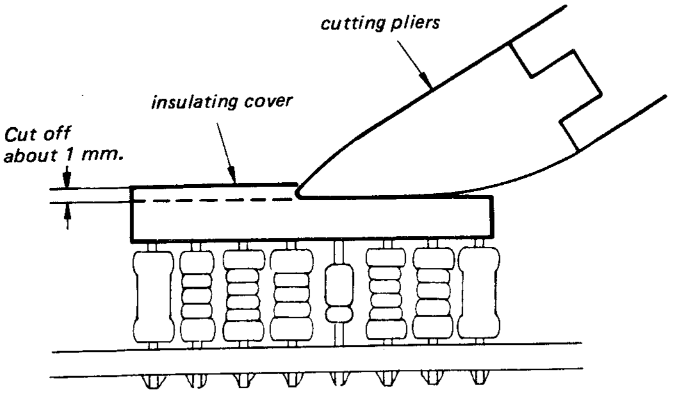
REPAIRING PRECAUTIONS

When changing IC501 or the parts surrounding IC501, perform as follows:

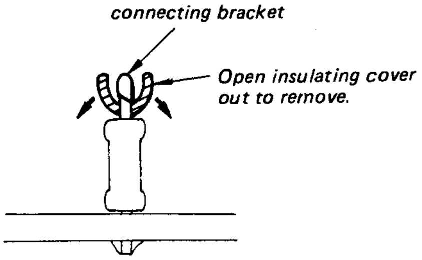
1. Remove jumper wire Ⓐ .
2. Replace the IC, transistor, or battery.
3. Connect jumper wire Ⓐ .
4. Turn the power ON.
5. Short-circuit terminal pin momentarily. (reset)

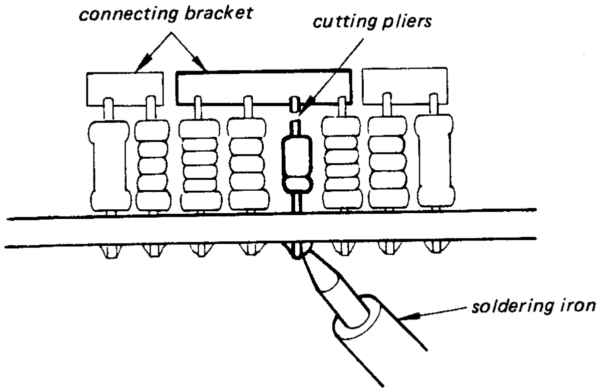

Short Circuit
Ⓐ
IC501
CP501
CP502
Q404
Q405
Q501
Q503
Q504
Q505
Q506
Q507
Q508
Q509
Q510
D501
D502
D503
D504
D505
D506
D507
D508
R423
R501
R502
R503
R504
R505
R506
R507
R508
R509
R511
R512
R513
R514
R515
R516
R517
R518
R519
R520
R521
R522
R523
R524
R525
R416
C413
C417
C501
C504
C113
C115
C712
L401
JW65 (+/−)
29 (25k)
30 (50k)
BA501
BATTERY
3V
RED
WHT
BLU
YEL

REPAIR METHOD FOR HYBRID CIRCUIT BLOCK

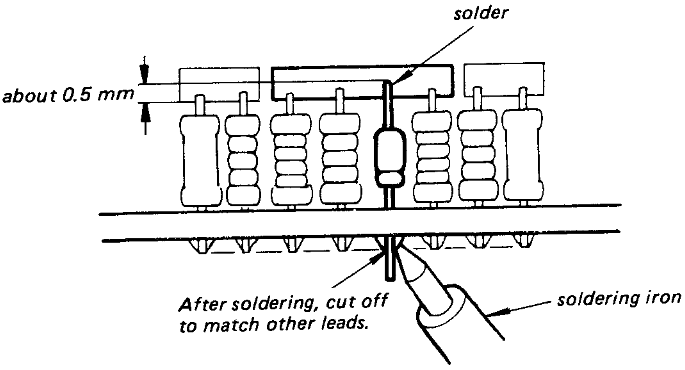

cutting pliers
insulating cover
Cut off about 1 mm.

Using a cutting pliers, cut off the upper portion of the insulating cover about 1 mm, exposing the top of the connecting brackets.


connecting bracket
Open insulating cover out to remove.

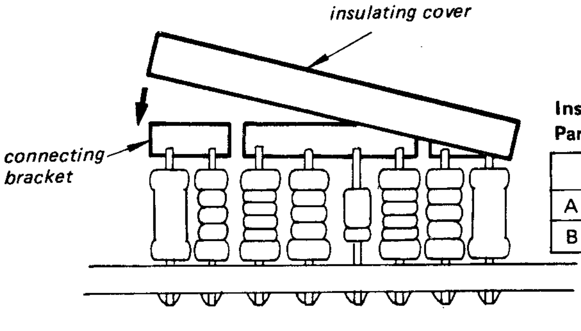

connecting bracket
cutting pliers
soldering iron

Cut off the lead of the defective part with cutting pliers. Remove solder and take out the defective part.


solder
about 0.5 mm
After soldering, cut off to match other leads.
soldering iron

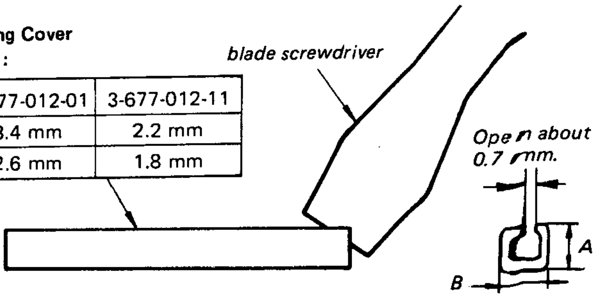
Insert the new part on the board and solder the lead to the board. Cut off the lead on the connecting bracket side so that it overlaps by about 0.5 mm, and solder to the connecting bracket.

Open the insulating cover groove about 0.7 mm and place over the connecting brackets, positioning one end first.


insulating cover
connecting bracket

Insulating Cover Part No.:

	3-677-012-01	3-677-012-11
A	3.4 mm	2.2 mm
B	2.6 mm	1.8 mm

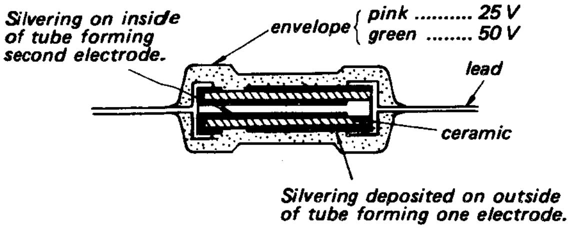

blade screwdriver
Open about 0.7 mm.
A
B

• THE CERAMIC CAPACITORS

This set uses tube-type ceramic capacitors whose shape is identical with the carbon resistors. Be careful not to use resistors instead of capacitors in repairing.

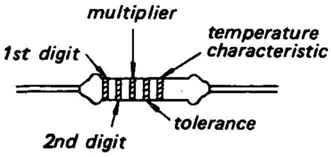
Disc-type ceramic capacitors can be used for replacing those originally used in the set.

Two kinds of drilled holes are provided in some patterns for mounting the tube-type and disc-type ceramic capacitors. Use appropriate holes where applicable.

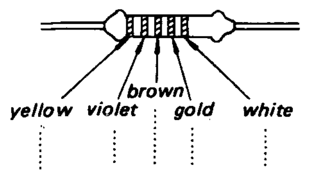

Silvering on inside of tube forming second electrode.
envelope { pink .... 25 V
green .... 50 V
lead
ceramic
Silvering deposited on outside of tube forming one electrode.

COLOR CODE (in pF)

Color	1st or 2nd Digit	Multiplier	Tolerance	Temperature charac-teristic
brown	1	10^1		Y
red	2	10^2		D
orange	3	10^3		
yellow	4	10^4		RH
green	5			
blue	6			
violet	7			UJ
gray	8		±30%	X
white	9			SL
black	0	10^0	±20%	CH
gold		10^{-1}	± 5%	V
silver		10^{-2}	±10%	B


multiplier
temperature characteristic
1st digit
2nd digit
tolerance

Example:

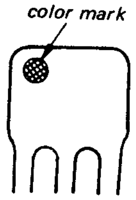

yellow
violet
brown
gold
white

4 7 10^1 ±5% SL ➡ 470pF ±5% SL

• IF OFFSET ADJUSTMENT:

Circuit Connections Depending on the Ceramic Filter (CF101 – 103)

This set employs five types of ceramic filter (CF101 – 103) which have different center frequency. Therefore FM IF offset adjustment by jumper wire connection is necessary to match the center frequency of the ceramic filter used with FM intermediate frequency.



Ceramic filter		Jumper wire connection			FM intermediate frequency (MHz)
Color mark	Center frequency (MHz)	JW29 (25k)	JW30 (50k)	JW65 (+/–)	
White	10.750	X	O	X	10.750
Orange	10.725	O	X	X	10.725
Red	10.700	X	X	X	10.700
Blue	10.675	O	X	O	10.675
Black	10.650	X	O	O	10.650

O : connected
X : not connected

FM intermediate frequency is determined by five types as shown above with specifing the state at terminal 24, 25, and 26 of IC402 (PLL controller) by Jumper wire connection.

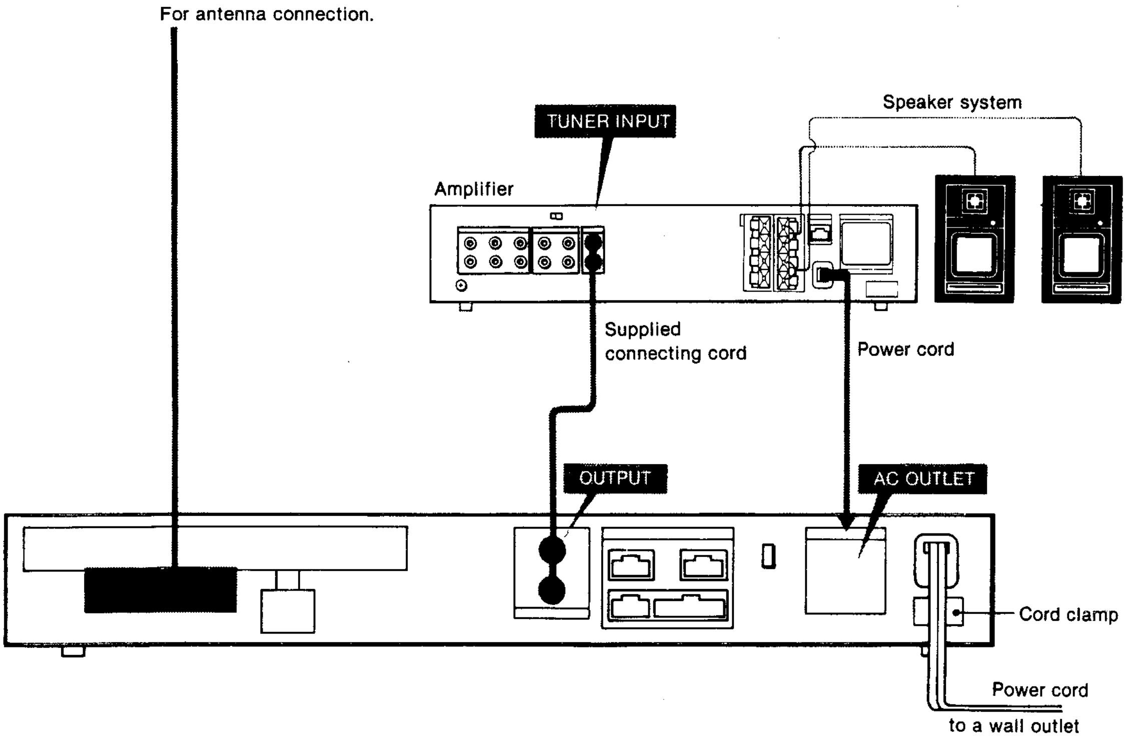
*CF101, 102 and 103 should be used the ceramic filters of same center frequency.

SYSTEM CONNECTIONS

The power cord should be connected last of all, first making sure that the MAIN POWER switch is turned off.

CONNECTION DIAGRAM

Connection to the amplifier

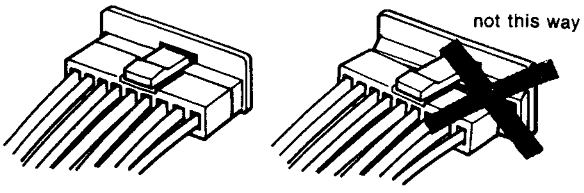

For antenna connection.
TUNER INPUT
Speaker system
Amplifier
Supplied connecting cord
Power cord
OUTPUT
AC OUTLET
Cord clamp
Power cord
to a wall outlet

REMOTE CONTROL CORD CONNECTION

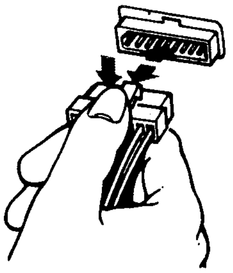
Control signals from the remote commander RM-V70 in the form of infrared rays are received by the remote sensor provided on the front panel of the tuner. The control signals should be delivered to all components through the supplied cords.

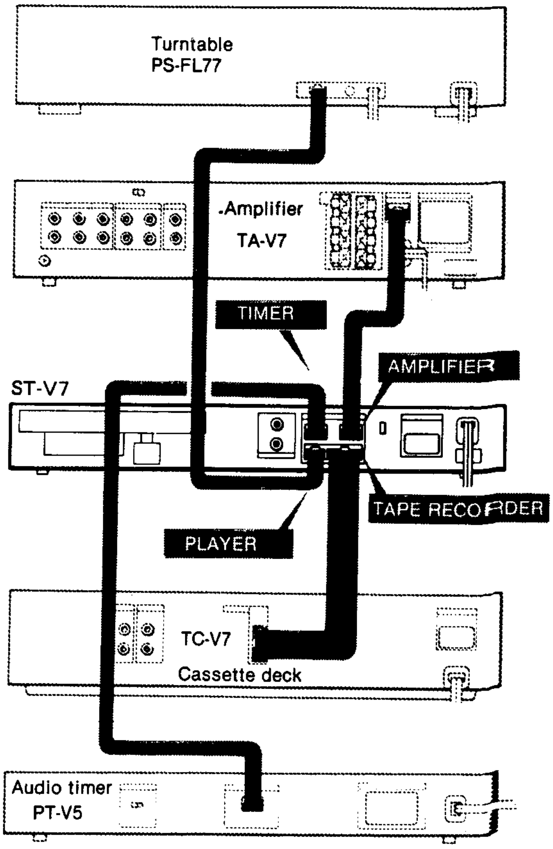
Notes

- Insert the cords firmly by depressing the small tab on the plug. A loose connection may cause faulty operation of the remote control.


not this way

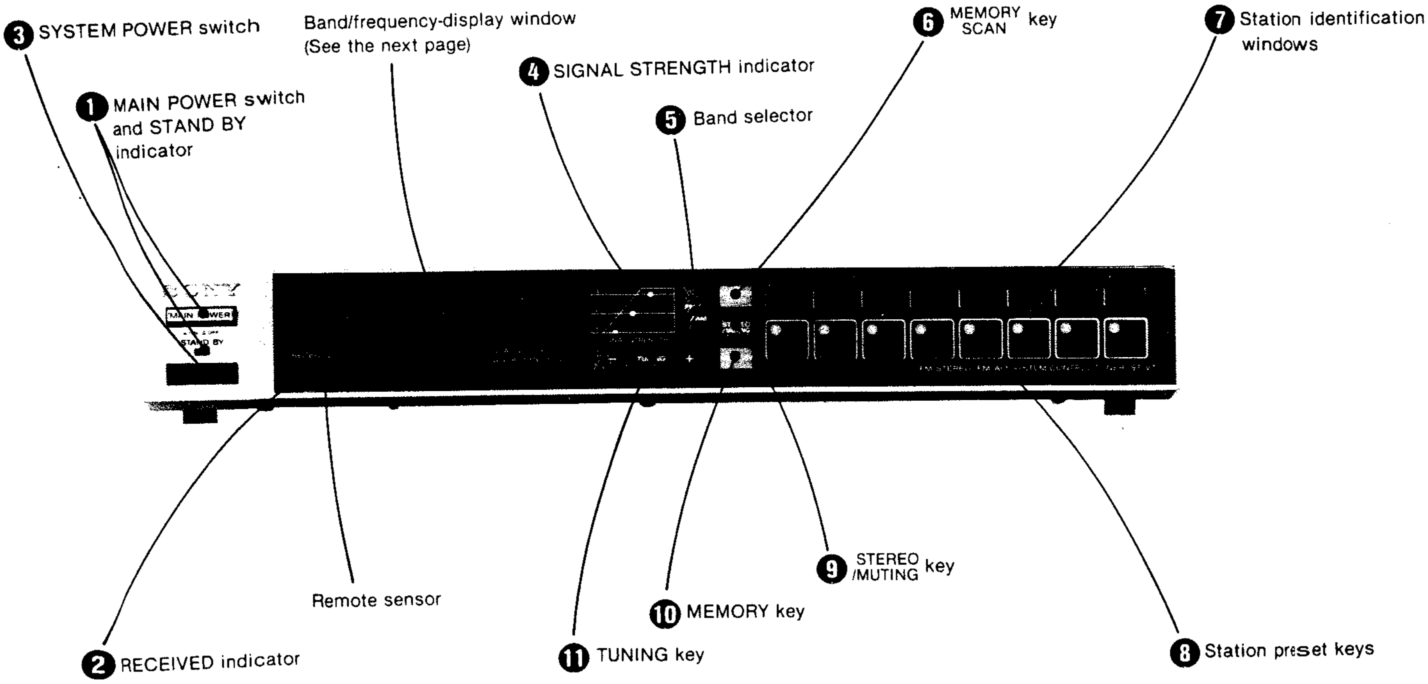
- To remove the cord from the connector, depress the small tab on the plug and pull it out. Never pull out the plug forcibly.




Turntable
PS-FL77
Amplifier
TA-V7
TIMER
AMPLIFIER
ST-V7
TAPE RECORDER
PLAYER
TC-V7
Cassette deck
Audio timer
PT-V5

LOCATION AND FUNCTION OF CONTROLS

Before plugging in or attempting to operate this tuner, it is suggested that you familiarize yourself with all its switches and the purpose of each.
Each number in the photo is keyed to the descriptive text.



① MAIN POWER switch and STAND BY indicator
Depress this switch to turn the mains power on (The STAND BY indicator lights up). If the power has not been turned on, even if you press the SYSTEM POWER switch, you cannot turn the connected components on or operate them with the supplied remote commander RM-V70.

② RECEIVED indicator
When the signals from the remote commander are received, this indicator will blink.

③ SYSTEM POWER switch
Press this switch to turn the connected components on and off. You can operate the switch from a distance with the remote commander.

④ SIGNAL STRENGTH indicator
Indicates the strength of the tuned signal by the amount of indicator illumination. The fullest illumination means the antenna input signal is strong. When the indicator illuminates only at the low end, it means the antenna input signal is weak.

⑤ Band selector
Selects the desired band: FM, AM. Each time the selector is pressed, the band will change and the selected band will be indicated in the band/frequency-display window.

⑥ MEMORY SCAN key
Press for automatic scanning of the stations memorized on the station preset keys. For details, refer to page 11.

⑦ Station identification windows
Station labels (supplied) identifying memorized stations can be placed in these windows.

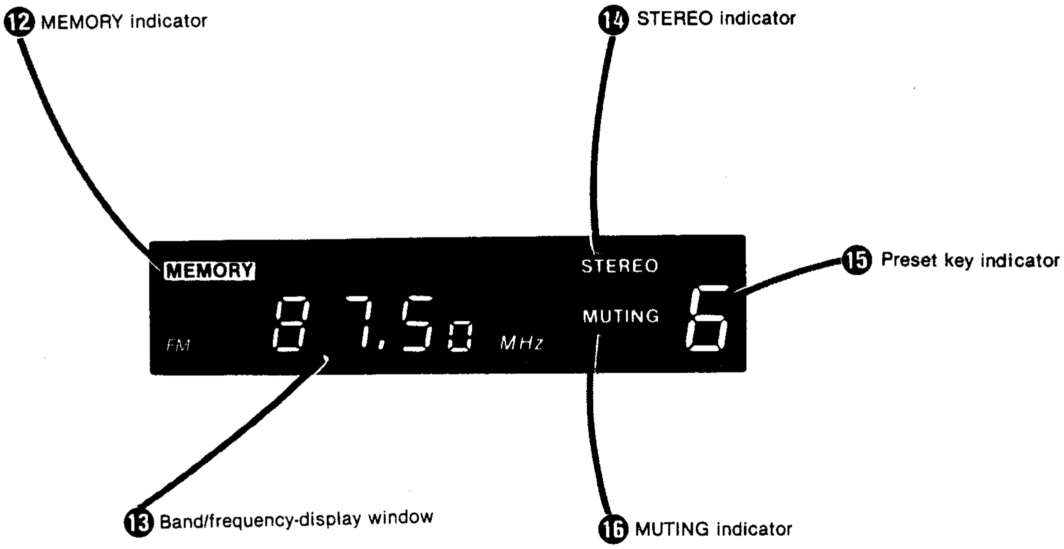
⑧ Station preset keys
To call up a memorized station, press the appropriate key.

⑨ STEREO /MUTING key
This key serves the dual purpose of a mode and FM muting switch. Normally keep this key engaged (the MUTING indicator illuminates) to eliminate FM interstation noise while tuning from station to station. The tuner operates in stereo mode for stereo sound sources and will be automatically switched to mono mode for monaural sound sources.
When you want to tune in a very weak station, or when an FM program is too noisy, press the key to disengage it. (The MUTING indicator illumination will go out.) This will enable the tuner to receive weak stations, although the stereo feature is sacrificed. In this case, keep the amplifier volume down to avoid speaker damage caused by the interstation noise.

⑩ MEMORY key
Press to operate memory circuit. The MEMORY indicator will appear on the band/frequency-display window for a few seconds indicating that the memory circuit is standing by.

⑪ TUNING key
Press either side of this key to change the received frequency.
Press the left side [–] to go to a lower frequency and the right side [+] to go to a higher.
To change the frequency continuously until the desired frequency is received, keep the key pressed.
The frequency figures will change rapidly. To change the frequency slowly to tune in a station accurately, press the key and release immediately.

BAND/FREQUENCY-DISPLAY WINDOW AND INDICATORS


⑫ MEMORY indicator
⑭ STEREO indicator
⑮ Preset key indicator
MEMORY
STEREO
MUTING
FM
87.50
MHz
6
⑬ Band/frequency-display window
⑯ MUTING indicator

⑫ MEMORY indicator
When the MEMORY key is engaged, "MEMORY" will appear for a few seconds indicating that the memory circuit is standing by.

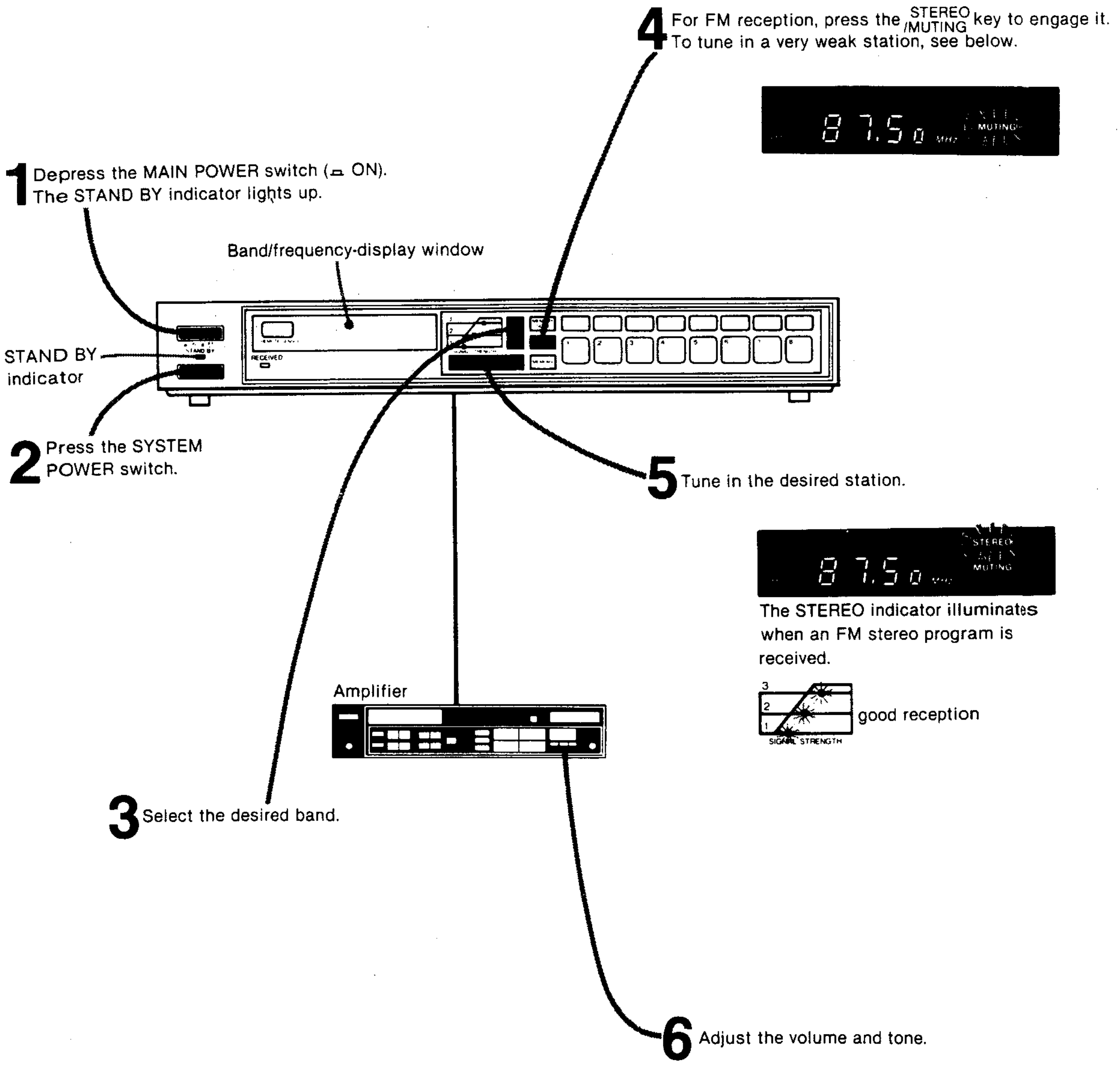
⑬ Band/frequency-display window
The frequency being received is displayed here in digits.

⑭ STEREO indicator
This indicator will light when an FM stereo program of sufficient signal strength is tuned in with the STEREO/MUTING key engaged.

⑮ Preset key indicator
When the station preset key is pressed, a figure from 1 to 8 corresponding to the pressed key will appear.
When the MEMORY SCAN key is pressed, the figures will change in sequence.

⑯ MUTING indicator
This indicator illuminates when the STEREO/MUTING key is engaged.

MANUAL TUNING


Band/frequency-display window
STAND BY indicator
Amplifier
87.50 MHz
MUTING
STEREO
3
2
1
SIGNAL STRENGTH
good reception

1 Depress the MAIN POWER switch (▭ ON). The STAND BY indicator lights up.

2 Press the SYSTEM POWER switch.

3 Select the desired band.

4 For FM reception, press the STEREO /MUTING key to engage it. To tune in a very weak station, see below.

5 Tune in the desired station.

The STEREO indicator illuminates when an FM stereo program is received.

6 Adjust the volume and tone.

When the frequency figures reach the end of the tuning range of each band, the frequency will then be scanned from the opposite end of the tuning range.

To tune in a weak or noisy station

When FM stereo signals are noisy, or to tune in a very weak FM station, lower the volume and disengage the STEREO /MUTING key. The MUTING indicator will go out. This will result in better reception, at the sacrifice of the stereo effect.

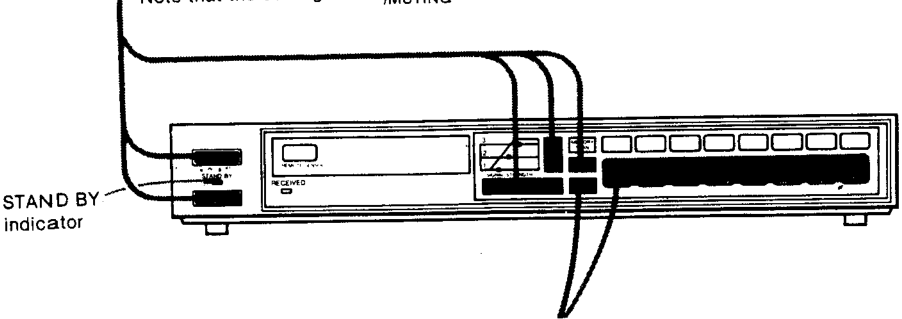
MEMORY PRESET TUNING

This tuner's electronic tuning system (utilizing a PLL—Phase Locked Loop—synthesizer) and a memory circuit make tuning very easy. Once the frequencies of the stations you want to tune in are memorized, all you have to do is press a key.

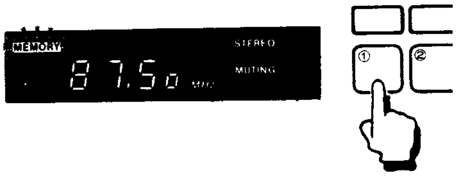
TO MEMORIZE STATION FREQUENCIES

Preparation: A total of eight station preset keys can be preset for FM, AM in any desired sequence. Arrange the order of stations for each station preset key and note the band and the frequency of each in advance.

1 Tune in a desired station following the procedure described in "MANUAL TUNING."
Note that the setting of the STEREO/MUTING key for reception of this station are memorized.



2 Press the MEMORY key to engage it.
While the MEMORY indicator is illuminated, press the disired station preset key.



Repeat these steps for each station preset key.
Replace the station labels to conform to the selected memorized stations.

Notes

- The MEMORY indicator will go off automatically after a few seconds. When the indicator is out, the memory circuit does not operate to memorize the station.
- The previous memory will be erased when a new frequency is committed to the memory of the same key. An erasure cannot be made without a new input.

TO CHECK A MEMORIZED FREQUENCY

After the memory procedure is completed, confirm the memorized frequency. Press the TUNING key and change the frequency display indication. Press the station preset key to be checked. The frequency which had been memorized should then be indicated in the band/frequency display window.

TO RECEIVE A MEMORIZED STATION

Depress the MAIN POWER switch, press the SYSTEM POWER switch to turn it on and press the desired station preset key.

Memory of the last received station
This tuner includes a memory circuit to remember the station which had been received for more than one second just before the power was turned off. This station will be automatically tuned in when the power is turned on again. This memory system enables you to make a timer-activated recording from the tuner.

To change temporarily the setting of the STEREO/MUTING key. for memorized station
Simply press the STEREO/MUTING key.
You can recall the original settings later by pressing the station preset key. See page 8 for STEREO/MUTING key

MEMORY SCANNING

The MEMORY SCAN key allows you to quickly hear what kind of programs are being broadcast by the memorized stations.
When you press the MEMORY SCAN key, the memorized stations are automatically received in order from the memorized station to the immediate right of the station being received for about 4 seconds each.
Pressing a particular station preset key stops the scanning.
When you press the MEMORY SCAN key during manual tuning, scanning will start from the station memorized on the leftmost station preset key.

SECTION 1
OUTLINE

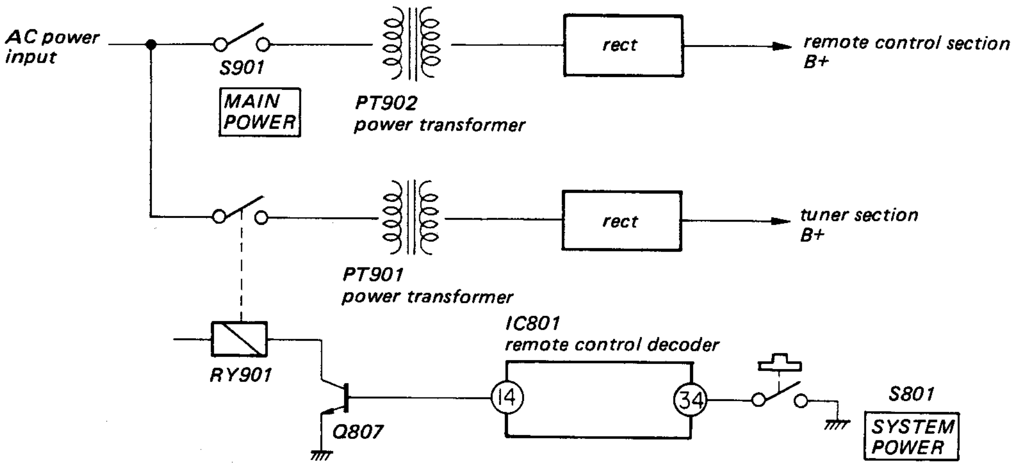
1-1. CIRCUIT DISCRIPTION

POWER SUPPLY SECTION

When the MAIN POWER switch (S901) goes ON, power is supplied to the remote control section and the STAND BY display LED lights up. In this state, the remote control operation of amp, player, tape recorder, and timer become possible.

When the SYSTEM POWER switch (S801) is pushed, pin ㉞ of the remote control decoder IC801 goes low and output pin ⑭ goes low from high level, then Q807 turns ON. The power switch relay (RY901) operates and power is supplied to a power outlet and the tuner section.

When the SYSTEM POWER switch is pushed again, output pin ⑭ goes "H" and Q807 goes OFF, then the power supply to the tuner section is cut off.


AC power input
S901
MAIN POWER
PT902
power transformer
rect
remote control section B+
rect
tuner section B+
PT901
power transformer
IC801
remote control decoder
RY901
Q807
14
34
S801
SYSTEM POWER

THE DISPLAY CIRCUIT

Fluorescent Display Tube

The fluorescent display structure is as shown below. The grid separates in each block. If B– voltage is supplied to the grid, the display tube will not light up. If B+ voltage is supplied to the grid and a voltage equal to that of the grid, or a larger voltage is supplied to the display section (plate), then current flows and that portion lights up.

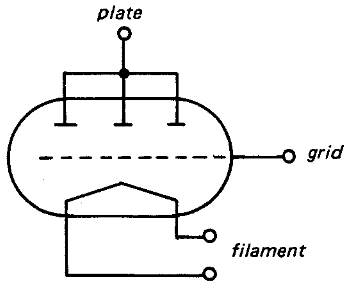
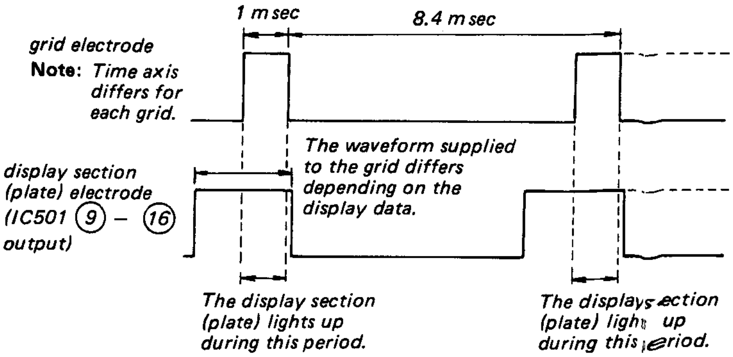


plate
grid
filament

The Waveforms Supplied to the Grid and the Plate

The drive signal of the grid electrode switches the grid drive transistor Q504 – Q509 by the digit signal from ⑧, ⑰, ⑱, ⑲, ⑳, ㉒ pins of IC501 for control. When the grid drive transistor is OFF, the grid electrode of the fluorescent display tube becomes negative potential (–28 V) through the emitter resistor and the display section (plate) does not light up. When the grid drive transistor is ON, the grid electrode of the fluorescent display tube becomes positive potential (4 V). When both the grid electrode and the display section (plate) are positive potential, the display section lights up. The drive signal of the plate electrode is controlled by segment display data output from ⑨, ⑩, ⑪, ⑫, ⑬, ⑭, ⑮, ⑯ pins of the IC501 for control.


1 msec
8.4 msec
grid electrode
Note: Time axis differs for each grid.
display section (plate) electrode (IC501 ⑨ – ⑯ output)
The waveform supplied to the grid differs depending on the display data.
The display section (plate) lights up during this period.
The display section (plate) lights up during this period.

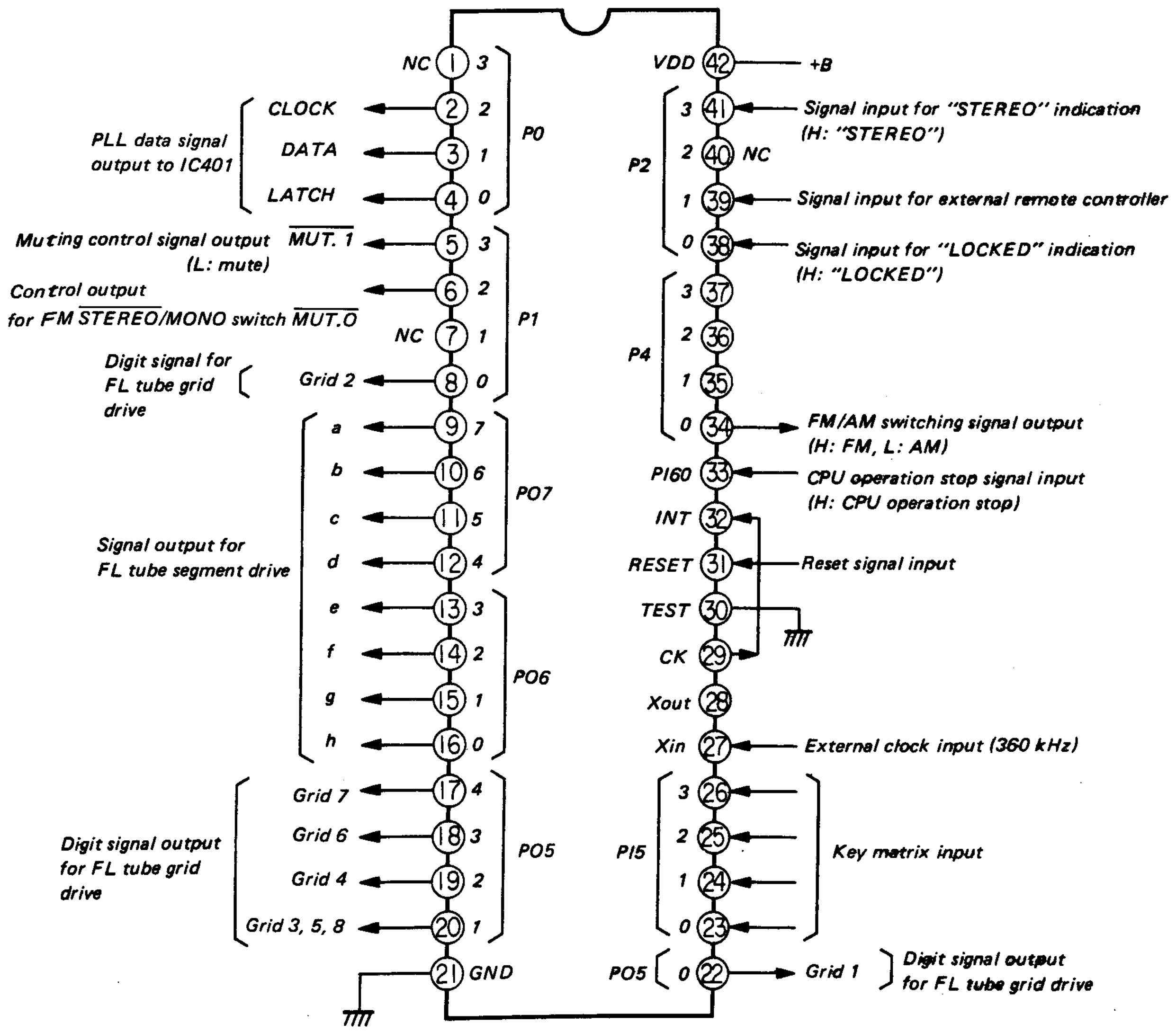
• CONTROLLER IC TCP4621BP-6505

IC501 (TCP4621BP-6505) is a microcomputer IC.
The terminal functions are as follows:
Main Functions:

- Key input detection
- Fluorescent indicator tube (FL501) indication output
- Data transmission to PLL frequency synthesizer IC (IC401: CX778A) (16 bit serial data)

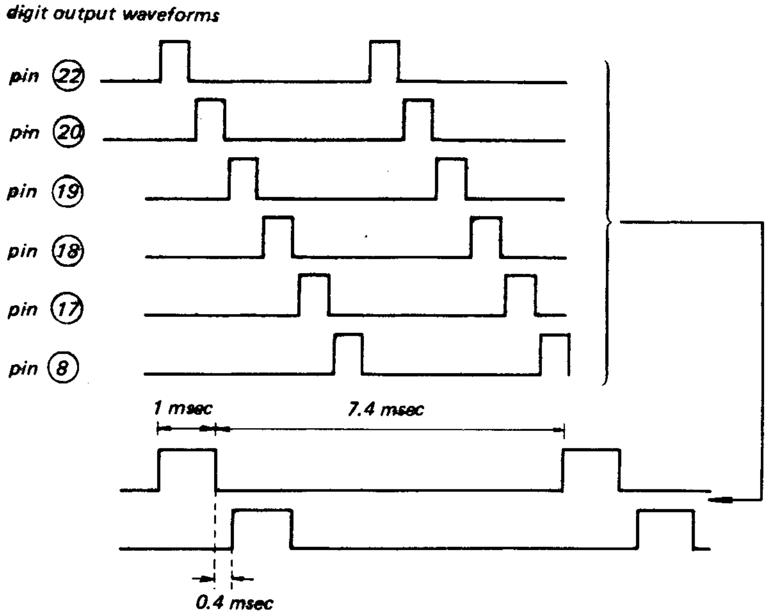
IC501 Terminal Functions

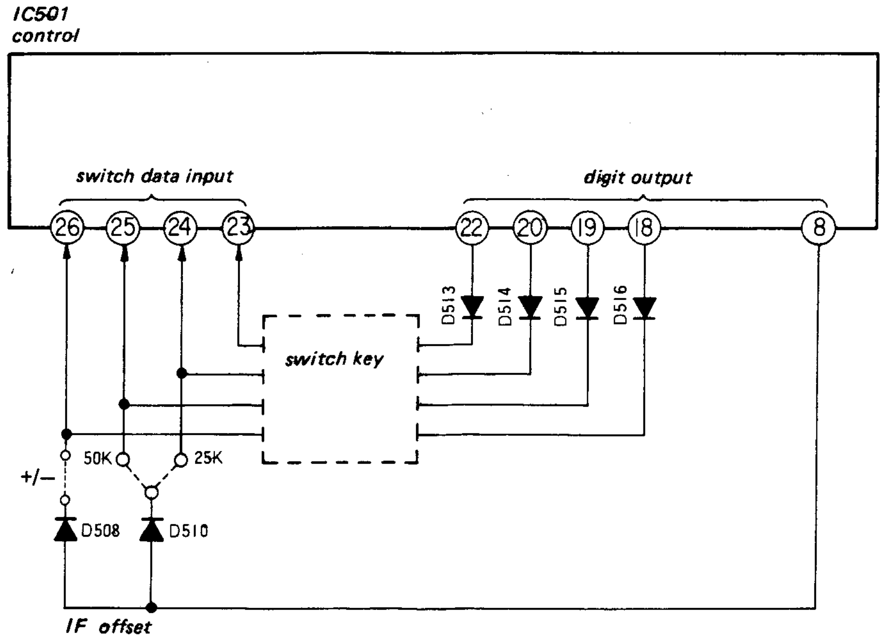
FL tube . . . Fluorescent Display Tube


NC ① 3
PLL data signal output to IC401
CLOCK ② 2
DATA ③ 1
LATCH ④ 0
P0
Muting control signal output (L: mute) MUT. 1 ⑤ 3
Control output for FM STEREO/MONO switch MUT.0 ⑥ 2
NC ⑦ 1
P1
Digit signal for FL tube grid drive Grid 2 ⑧ 0
Signal output for FL tube segment drive
a ⑨ 7
b ⑩ 6
c ⑪ 5
d ⑫ 4
PO7
e ⑬ 3
f ⑭ 2
g ⑮ 1
h ⑯ 0
PO6
Digit signal output for FL tube grid drive
Grid 7 ⑰ 4
Grid 6 ⑱ 3
Grid 4 ⑲ 2
Grid 3, 5, 8 ⑳ 1
PO5
㉑ GND
VDD (42) +B
P2
3 (41) Signal input for "STEREO" indication (H: "STEREO")
2 (40) NC
1 (39) Signal input for external remote controller
0 (38) Signal input for "LOCKED" indication (H: "LOCKED")
P4
3 (37)
2 (36)
1 (35)
0 (34) FM/AM switching signal output (H: FM, L: AM)
PI60 (33) CPU operation stop signal input (H: CPU operation stop)
INT (32)
RESET (31) Reset signal input
TEST (30)
CK (29)
Xout (28)
Xin (27) External clock input (360 kHz)
PI5
3 (26)
2 ㉕
1 ㉔
0 ㉓
Key matrix input
PO5 0 ㉒ Grid 1 Digit signal output for FL tube grid drive

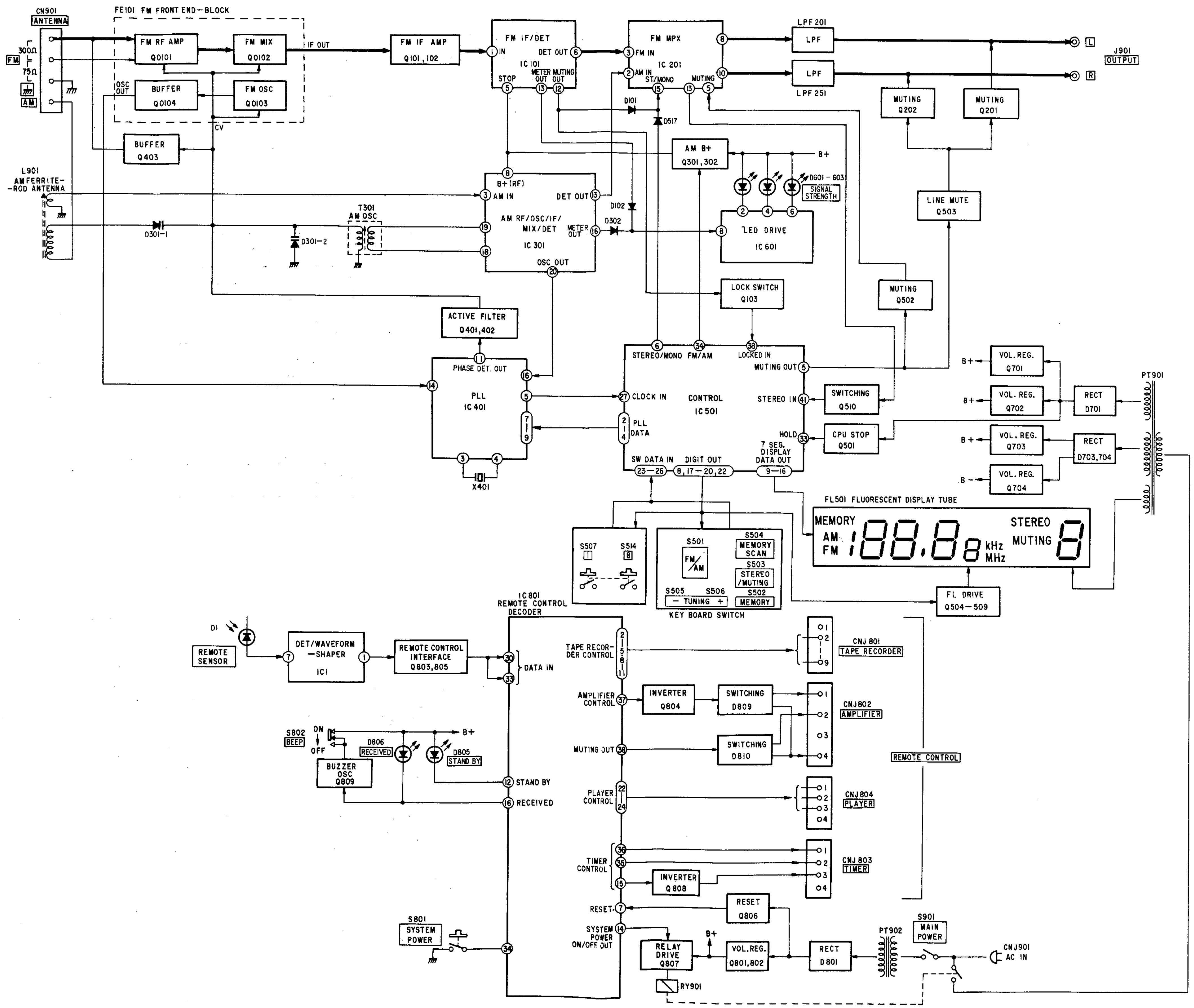
SWITCH DATA INPUT

The digit output from IC501 for tuner control is input into IC501 as each switch data by the key switch matrix, then each control output of tuner section is output.




IC501 control
switch data input
㉖ ㉕ ㉔ ㉓
digit output
㉒ ⑳ ⑲ ⑱ ⑧
D513
D514
D515
D516
switch key
50K
25K
+/–
D508
D510
IF offset

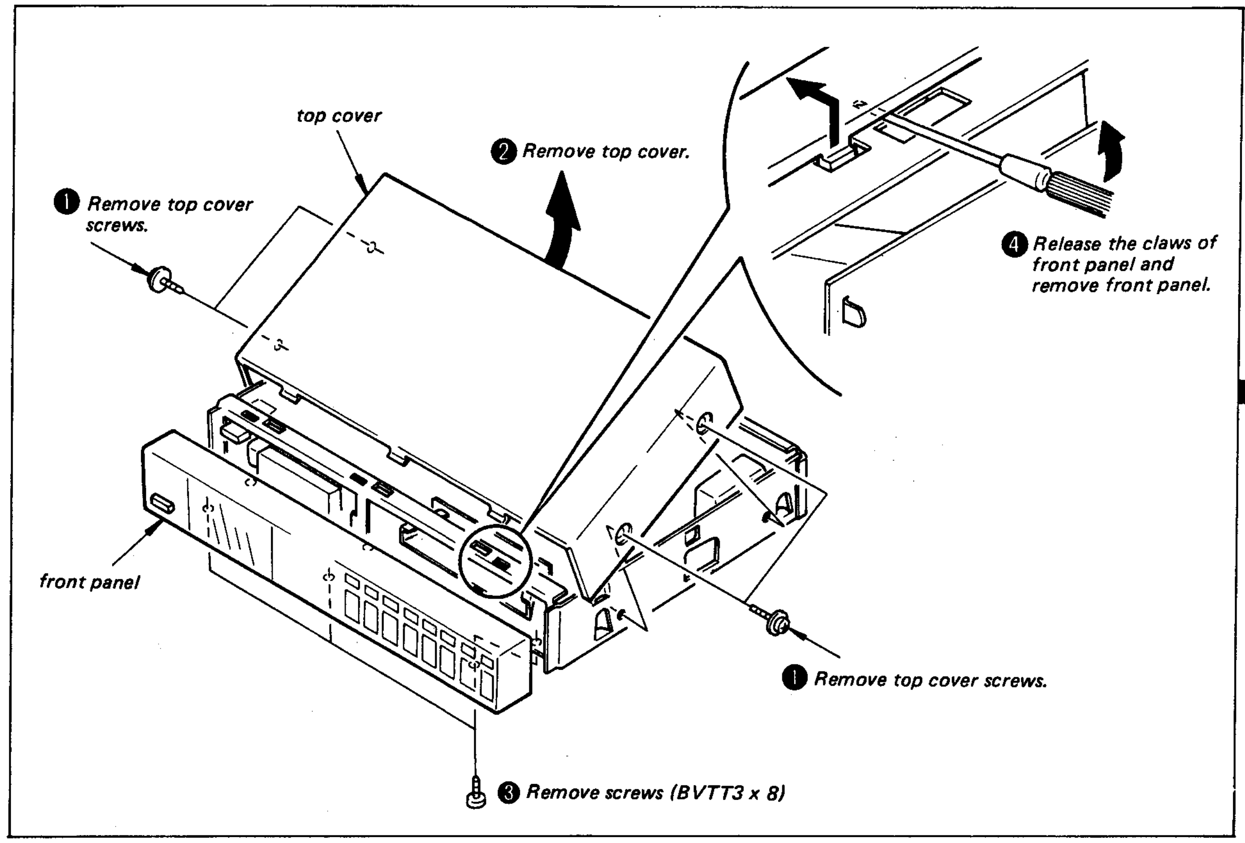
1-2. BLOCK DIAGRAM


CN901
ANTENNA
FM
300Ω
75Ω
AM
FE101 FM FRONT END-BLOCK
FM RF AMP Q0101
FM MIX Q0102
BUFFER Q0104
FM OSC Q0103
OSC OUT
IF OUT
CV
BUFFER Q403
FM IF AMP Q101,102
FM IF/DET IC101
IN
DET OUT
STOP
METER OUT
MUTING OUT
FM MPX IC 201
FM IN
AM IN
ST/MONO
MUTING
LPF 201
LPF
LPF 251
J901 OUTPUT
L
R
MUTING Q202
MUTING Q201
LINE MUTE Q503
D101
D517
D102
D302
AM B+ Q301,302
B+
D601 - 603 SIGNAL STRENGTH
LED DRIVE IC 601
L901 AM FERRITE-ROD ANTENNA
D301-1
D301-2
T301 AM OSC
B+(RF)
AM IN
DET OUT
AM RF/OSC/IF/MIX/DET IC 301
METER OUT
OSC OUT
ACTIVE FILTER Q401,402
PHASE DET. OUT
PLL IC 401
X401
LOCK SWITCH Q103
MUTING Q502
STEREO/MONO
FM/AM
LOCKED IN
MUTING OUT
CLOCK IN
CONTROL IC 501
STEREO IN
PLL DATA
HOLD
7 SEG. DISPLAY DATA OUT
SW DATA IN
DIGIT OUT
23—26
8, 17—20, 22
9—16
SWITCHING Q510
CPU STOP Q501
VOL. REG. Q701
VOL. REG. Q702
VOL. REG. Q703
VOL. REG. Q704
B+
B−
RECT D701
RECT D703,704
PT901
FL501 FLUORESCENT DISPLAY TUBE
MEMORY
AM
FM
188.88
kHz
MHz
STEREO
MUTING
8
FL DRIVE Q504—509
S507
S514
S501 FM/AM
S504 MEMORY SCAN
S503 STEREO/MUTING
S502 MEMORY
S505 S506 − TUNING +
KEY BOARD SWITCH
IC801 REMOTE CONTROL DECODER
D1
REMOTE SENSOR
DET/WAVEFORM—SHAPER IC1
REMOTE CONTROL INTERFACE Q803,805
DATA IN
S802 BEEP
ON
OFF
D806 RECEIVED
D805 STAND BY
BUZZER OSC Q809
STAND BY
RECEIVED
S801 SYSTEM POWER
TAPE RECORDER CONTROL
AMPLIFIER CONTROL
MUTING OUT
PLAYER CONTROL
TIMER CONTROL
RESET
SYSTEM POWER ON/OFF OUT
INVERTER Q804
SWITCHING D809
SWITCHING D810
INVERTER Q808
CNJ 801 TAPE RECORDER
CNJ802 AMPLIFIER
CNJ804 PLAYER
CNJ 803 TIMER
REMOTE CONTROL
RESET Q806
RELAY DRIVE Q807
RY901
VOL. REG. Q801,802
RECT D801
PT902
S901 MAIN POWER
CNJ901 AC IN

SECTION 2
DISASSEMBLY

2-1. TOP COVER AND FRONT PANEL REMOVAL

• Follow the disassembly procedure in the numerical order given.



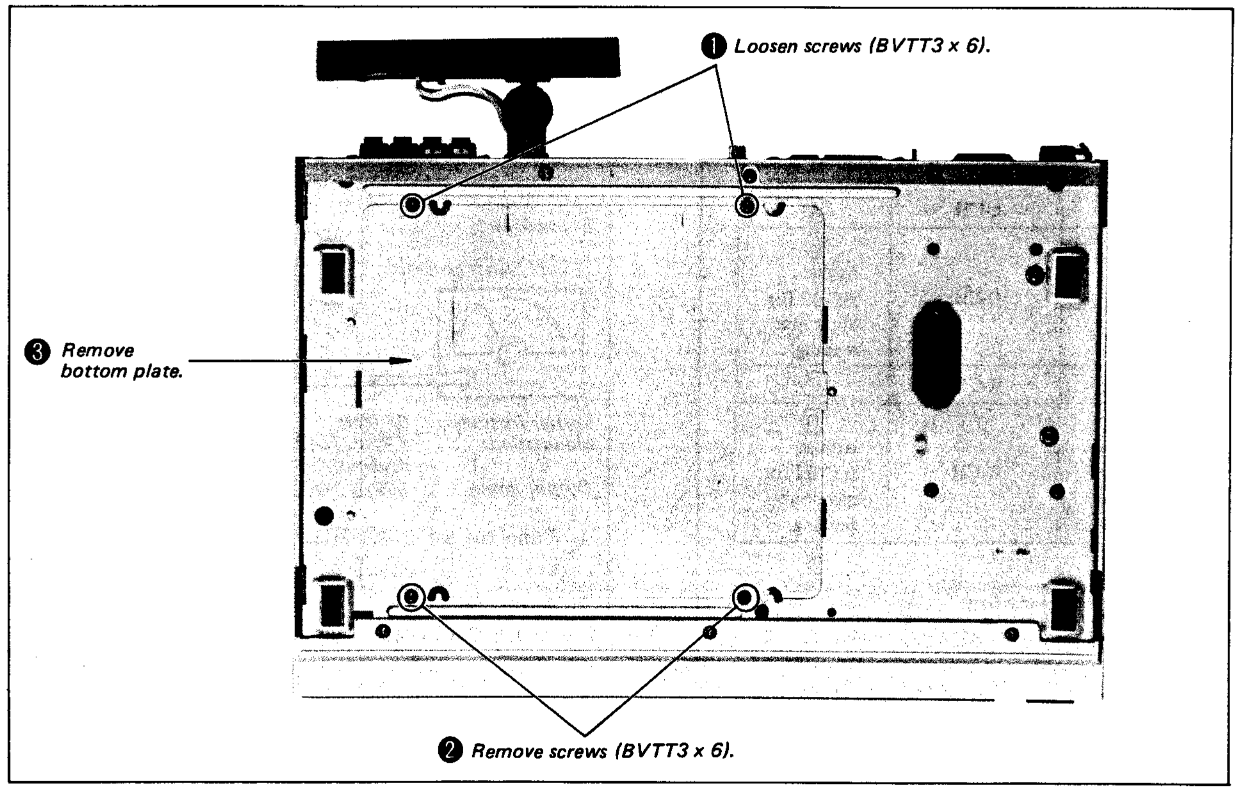
❶ Remove top cover screws.

❷ Remove top cover.

❸ Remove screws (BVTT3 x 8)

❹ Release the claws of front panel and remove front panel.

2-2. BOTTOM PLATE REMOVAL

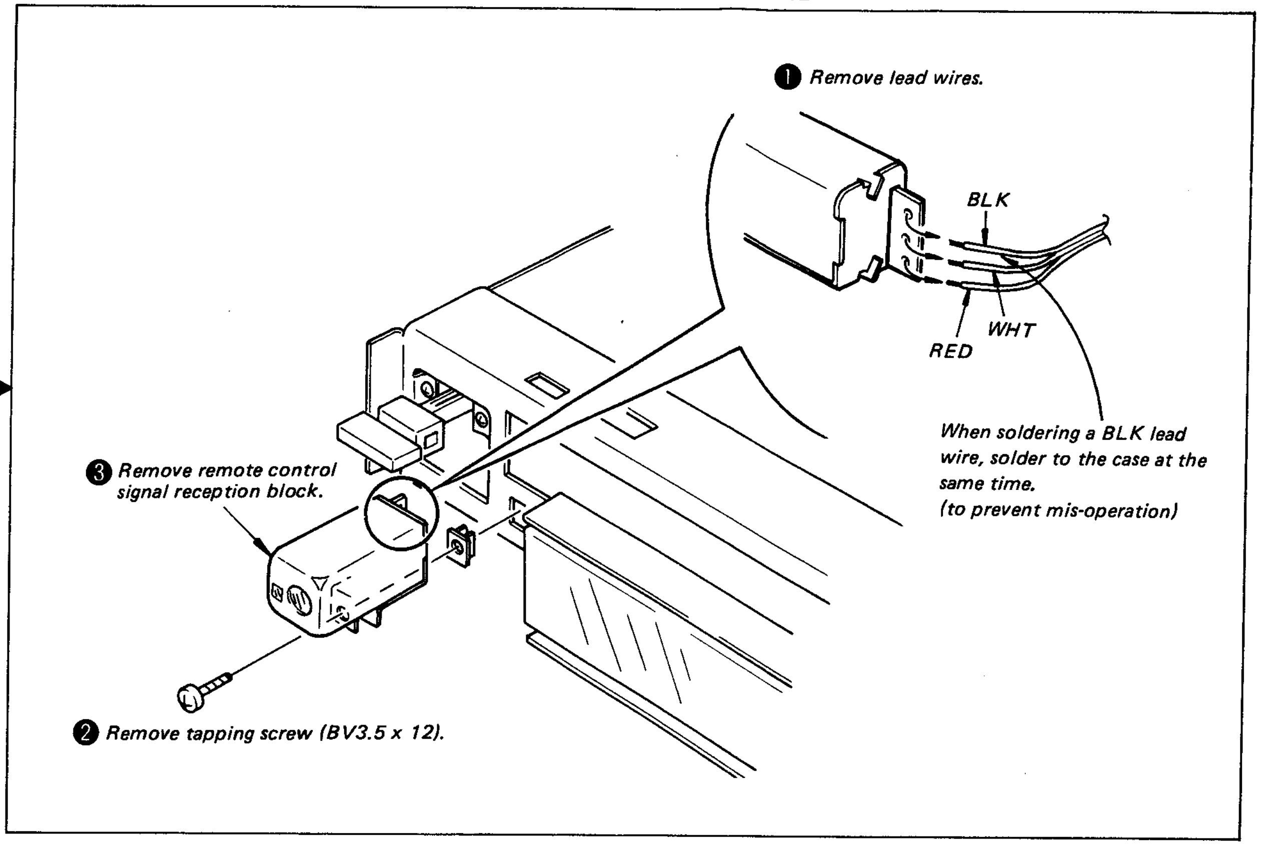


❶ Loosen screws (BVTT3 x 6).

❷ Remove screws (BVTT3 x 6).

❸ Remove bottom plate.

2-3. REMOTE CONTROL SIGNAL RECEPTION BLOCK REMOVAL



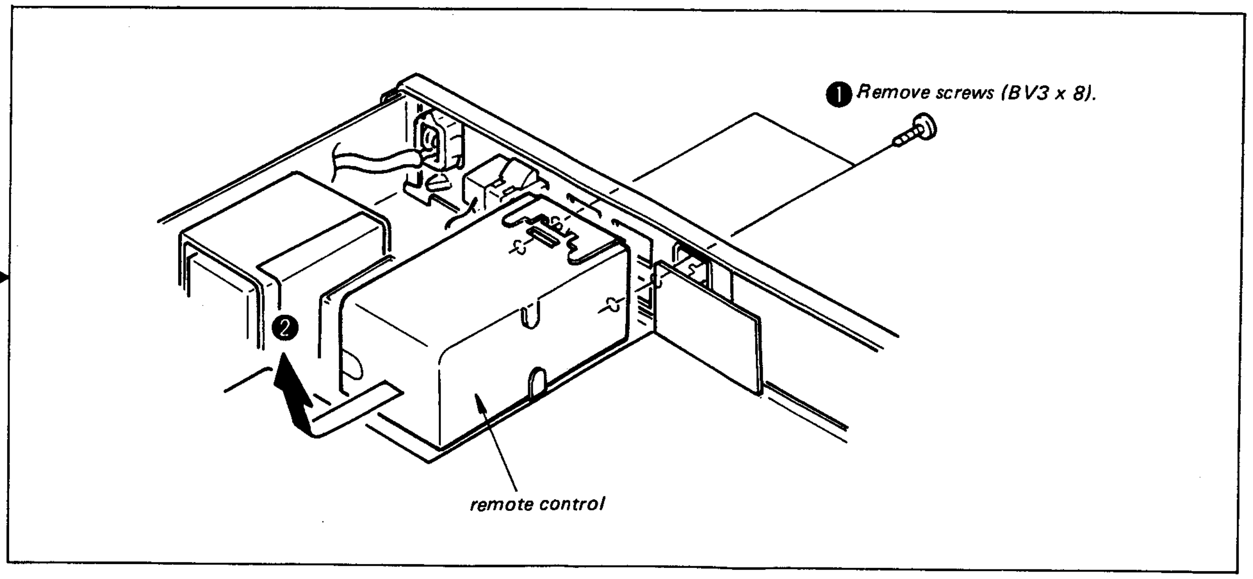
❶ Remove lead wires.

❷ Remove tapping screw (BV3.5 x 12).

❸ Remove remote control signal reception block.

When soldering a BLK lead wire, solder to the case at the same time. (to prevent mis-operation)

2-4. REMOTE CONTROL OUTPUT SECTION REMOVAL



❶ Remove screws (BV3 x 8).

SECTION 3
ADJUSTMENTS

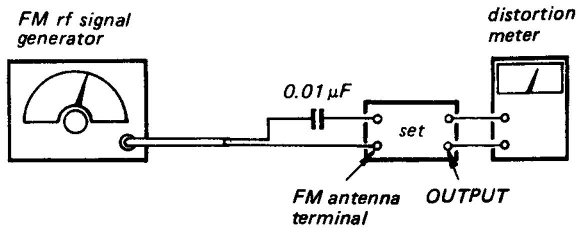
FM SECTION

FM Discriminator Alignment

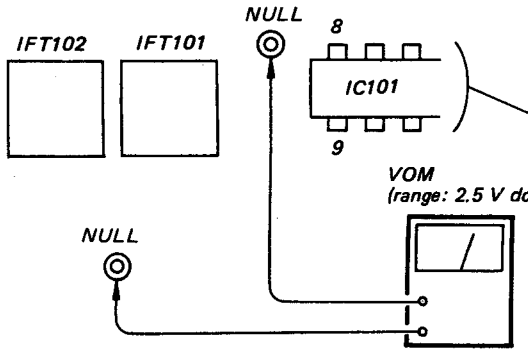
Setting:

STEREO/MUTING switch: OFF

Procedure:


FM rf signal generator
distortion meter
0.01 μF
set
FM antenna terminal
OUTPUT

Carrier frequency: *98 MHz*
Output level: *1 mV (60 dB)*
Modulation: *1 kHz, 75 kHz deviation (100 %)*


IFT102
IFT101
NULL
8
IC101
9
VOM (range: 2.5 V dc)
NULL

1. Tune the set to 98MHz.
2. Connect a VOM to NULL test point and adjust the primary-side core (IFT101) for 0V DC reading on the VOM.
3. Adjust the secondary-side core (IFT102) for a minimum reading on the distortion meter.

Note: Repeat the secondary-side and primary-side adjustments several times.
For step 3, adjust after removing VOM.

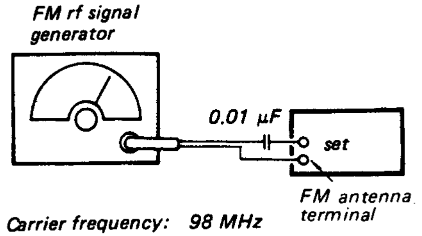
VCO Adjustment

Setting:

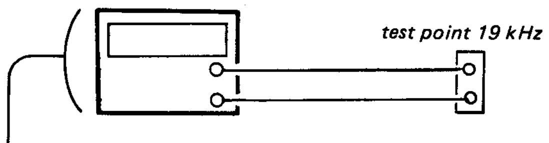
STEREO/MUTING Switch: ON

A) Regular Method

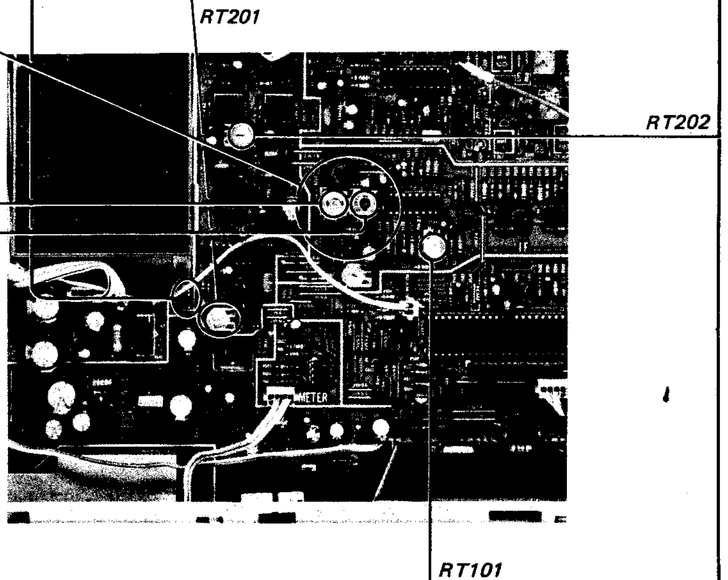
Procedure:


FM rf signal generator
0.01 μF
set
FM antenna terminal

Carrier frequency: *98 MHz*
Modulation: *no modulation*
Output level: *1 mV (60 dB)*


test point 19 kHz

1. Tune the set to 98 MHz.
2. Adjust RT201 for 19 kHz ± 50 Hz on the counter.

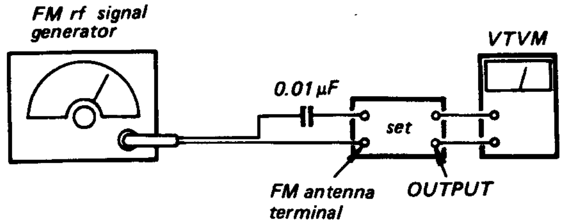

RT201
IFT102
IFT101
RT202
RT101
METER

FM Muting Level Adjustment

Setting:

STEREO/MUTING switch: ON

Procedure:


FM rf signal generator
VTVM
0.01 μF
set
FM antenna terminal
OUTPUT

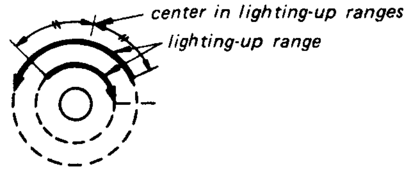
Carrier frequency: *98 MHz*
Modulation: *1 kHz, 75 kHz deviation (100 %)*
Output level: *17.8μV (25 dB)*

1. Tune the set to 98MHz by pressing the TUNING key.
2. Adjust RT101 for a 0V reading on the VTVM.

B) Simple Method

Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT201 clockwise or counterclockwise and memorize the lighting-up range of the stereo lamp.
3. Secure RT201 at the center of the lighting-up range of both turns as shown below.

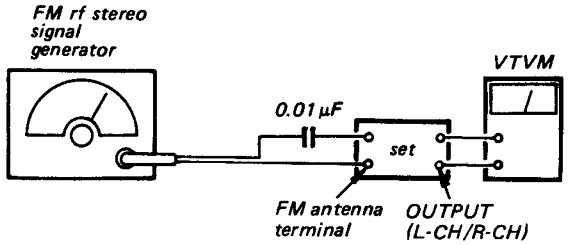

center in lighting-up ranges
lighting-up range

FM Stereo Separation Adjustment

Setting:

STEREO/MUTING switch: ON

Procedure:


FM rf stereo signal generator
VTVM
0.01 μF
set
FM antenna terminal
OUTPUT (L-CH/R-CH)

Carrier frequency: *98 MHz*
Output level: *1 mV (60 dB)*
Modulation:

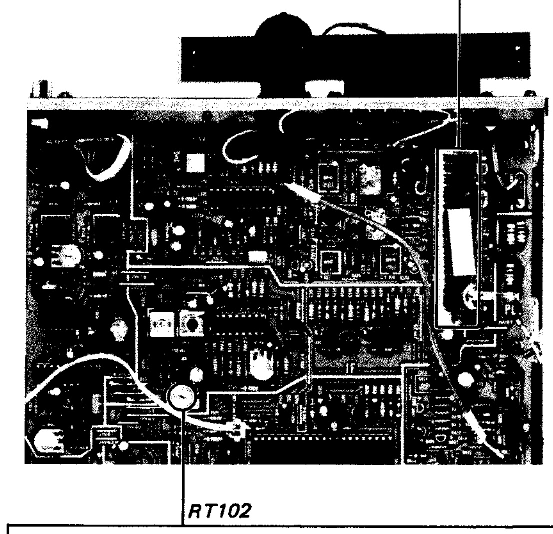
Audio (1 kHz): *33.75 kHz deviation (45 %)*
Pilot (19 kHz): *7.5 kHz deviation (10 %)*
Sub-channel: *33.75 kHz deviation (45 %)*

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT202 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT202 for minimum reading.

L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.

The FM front-end is carefully adjusted at the factory and is supplied as one whole block for replacement.

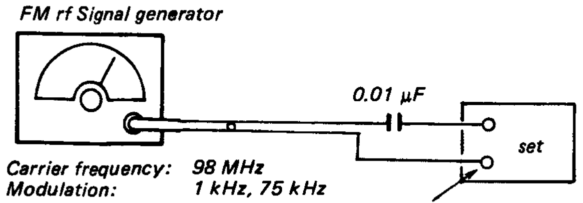


Meter Calibration

Setting:

STEREO/MUTING switch: ON

Procedure:

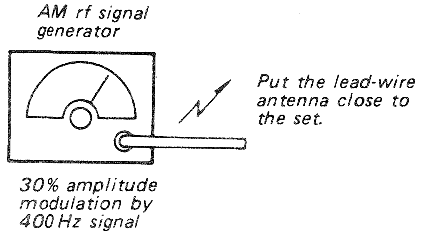

FM rf Signal generator
0.01 μF
set
FM antenna terminal

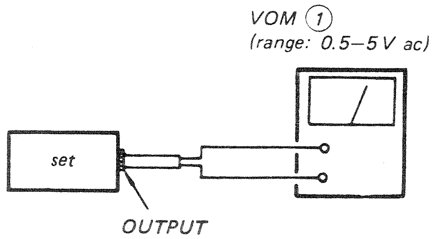
Carrier frequency: *98 MHz*
Modulation: *1 kHz, 75 kHz deviation (100%)*
Output level: *560μV (55 dB)*

1. Tune the set to 98 MHz by pressing the TUNING key.
2. Adjust RT102 for a location where the third LED of the SIGNAL STRENGTH display lights up.
3. Confirm that the first point lights up when the signal generator output level is 10 μV (20 dB).

AM SECTION

Setting:
Band Selector: AM
AM CH: 9 kHz

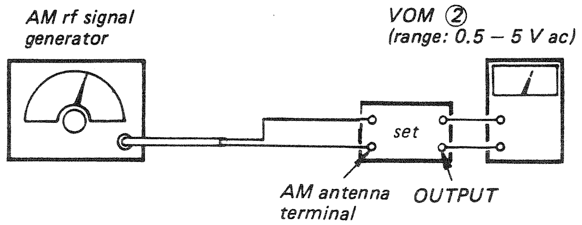

AM rf signal generator
Put the lead-wire antenna close to the set.
30% amplitude modulation by 400Hz signal


VOM ①
(range: 0.5–5 V ac)
set
OUTPUT

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

AM IF ALIGNMENT

Procedure:


AM rf signal generator
VOM ②
(range: 0.5 – 5 V ac)
set
AM antenna terminal
OUTPUT

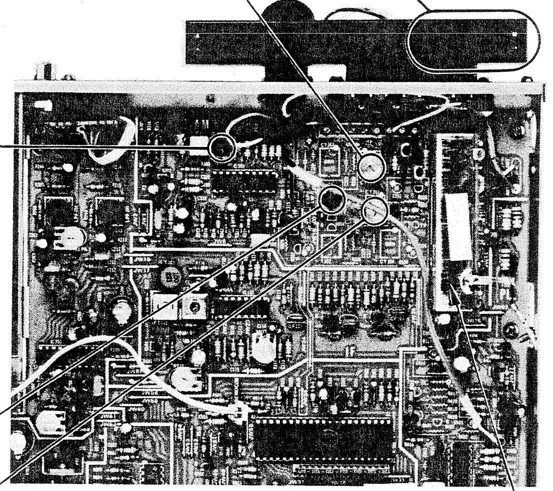
Carrier frequency: 450 kHz
30 % amplitude modulation
by 400 Hz signal
Output level: as low as possible

1. Tune the set to 450 kHz and adjust IFT301 for a maximum reading on VOM ②.

AM TRACKING ADJUSTMENT

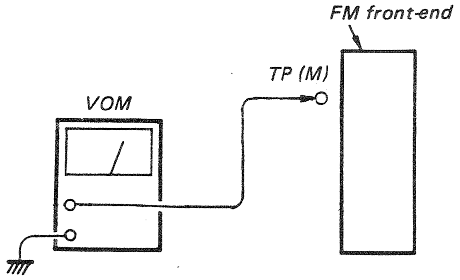
Adjust for a maximum reading on VOM ①.

CT301	L901
1,404 kHz	603 kHz



AM FREQUENCY COVERAGE ADJUSTMENT

Frequency Display	1,602kHz	522 kHz
Voltage at TP (M)	22 V	1.6 V
Adjustment Parts	CT302	T301

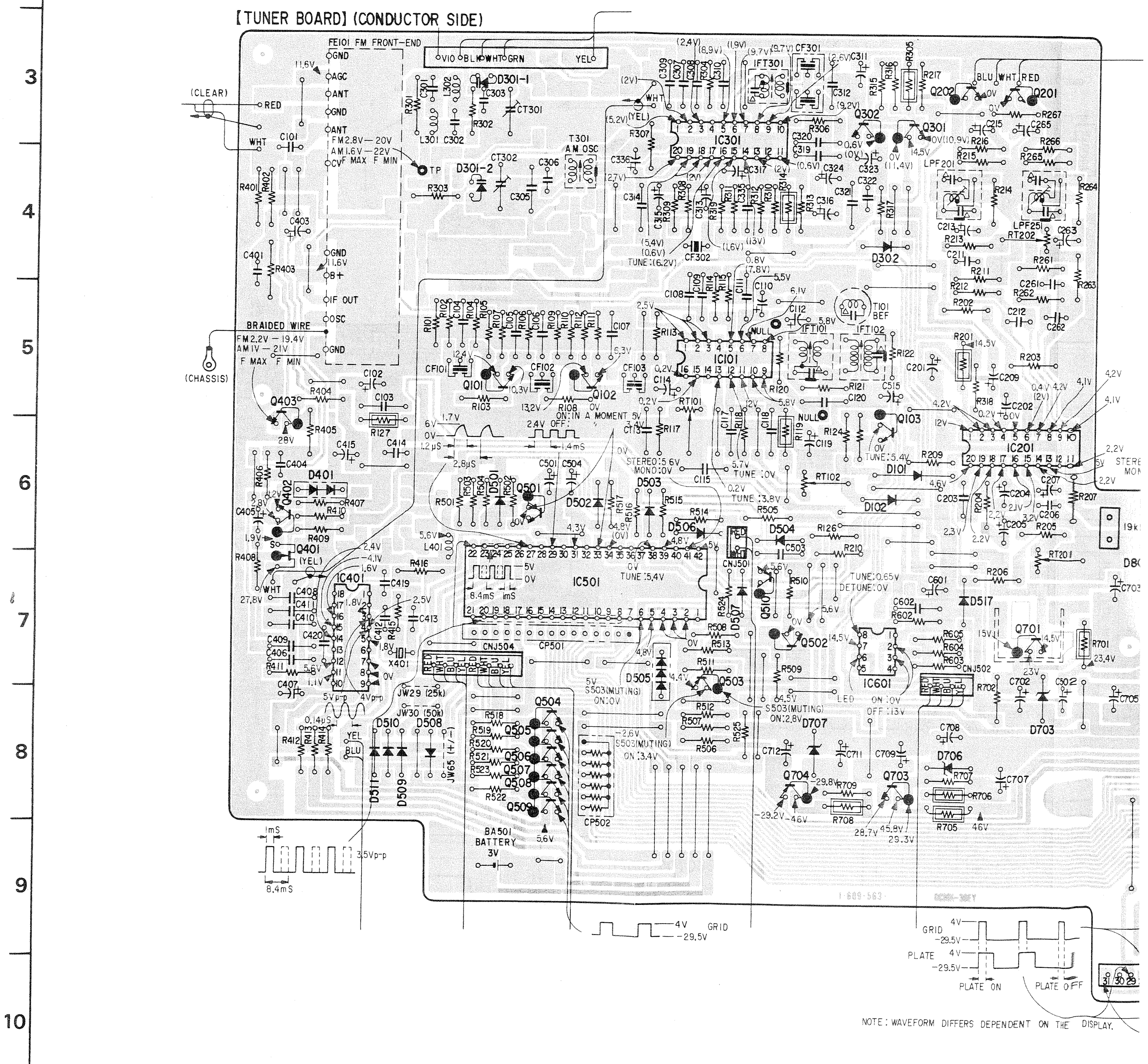

FM front-end
TP (M)
VOM

SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM
– TUNER BOARD –
– *Conductor Side* –

	A	B	C	D	E	F	G	H
Q IC		403 402 401	IC401	101 501 504 505 506 507 508	102 IC501 509	IC301 IC101 510 502 503 704	302 301 202 103 IC601 703	201 IC201 701
D			401 511 510 509 508	301-1 301-2 501	502 503 505 506	507 504 707	101 302 102 517 706	703

【TUNER BOARD】(CONDUCTOR SIDE)


FE101 FM FRONT-END
IC101
IC201
IC301
IC401
IC501
IC601
IFT301
T301 AM OSC
CT301
CT302
(CLEAR)
RED
WHT
BRAIDED WIRE
(CHASSIS)
BA501 BATTERY 3V
GRID
PLATE
PLATE ON
PLATE OFF

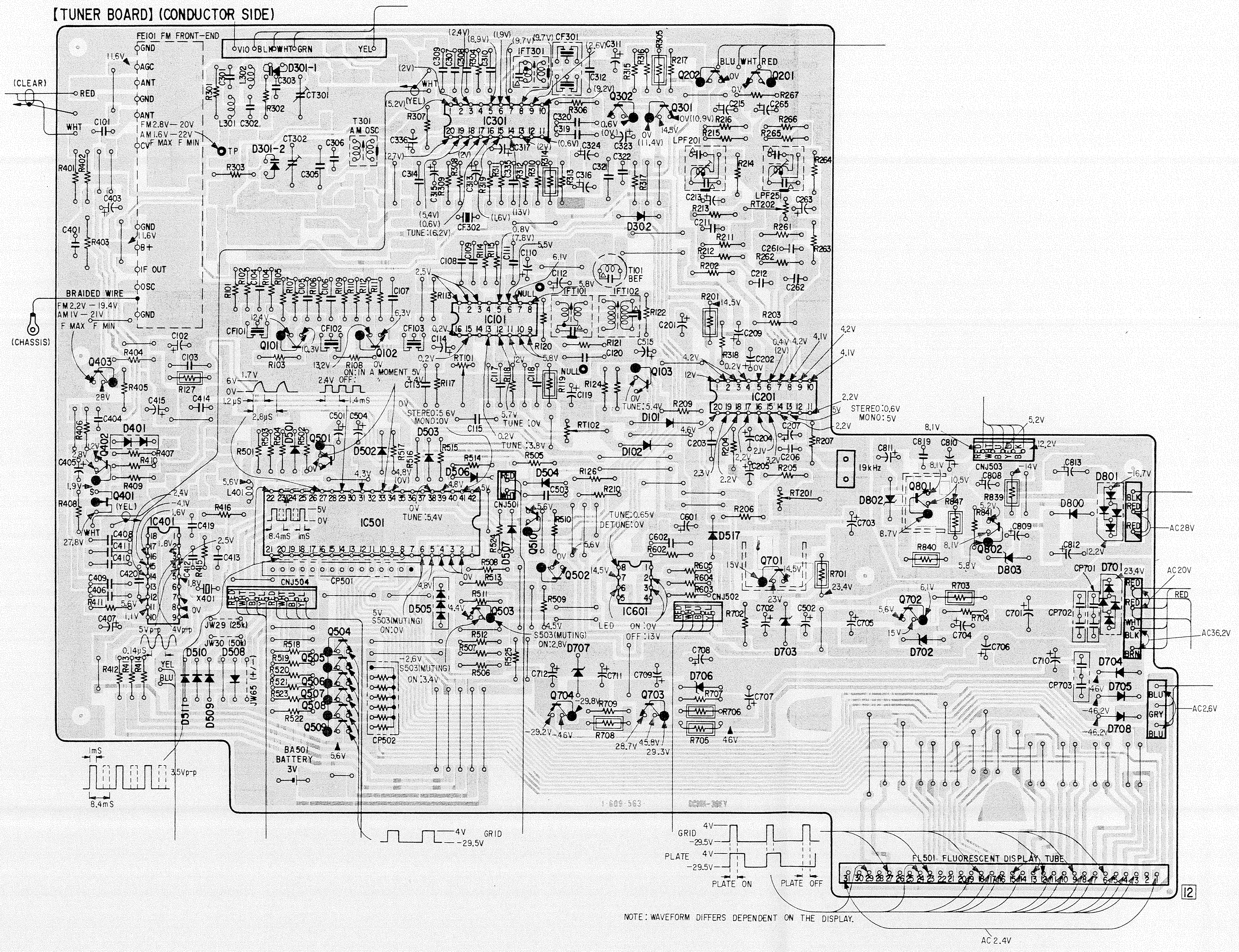
NOTE: WAVEFORM DIFFERS DEPENDENT ON THE DISPLAY.

SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM
— TUNER BOARD —
— Conductor Side —

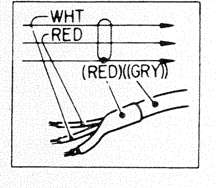
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Q IC		403 402 401	IC401	101 501 504 505 506 507 508	509 102 IC501	IC301 IC101 510 502 503 704	302 301 103 IC601 703 202	201 IC201 701	801 702	802					
D			401 511 510 509 508	301-1 301-2 501	502 503 505 506	507 504 707	101 302 102 517 706	703	802 702	803 800	801 701 704 705 708				

【TUNER BOARD】(CONDUCTOR SIDE)


1
2
3
4
5
6
7
8
9
10
FE101 FM FRONT-END
(CLEAR)
RED
WHT
BRAIDED WIRE
FM2.2V – 19.4V
AM1V – 21V
F MAX F MIN
(CHASSIS)
FM2.8V – 20V
AM1.6V – 22V
CV MAX F MIN
TP
T301 AM OSC
IC301
IC101
IC501
IC201
IC401
IC601
IFT301
IFT101
IFT102
T101 BEF
CF301
CF302
CF101
CF102
CF103
LPF201
LPF251
BLU WHT RED
VIO BLK WHT GRN YEL
CNJ501
CNJ502
CNJ503
CNJ504
CP501
CP502
CP701
CP702
CP703
BA501 BATTERY 3V
S503(MUTING) ON:0V
S503(MUTING) ON:2.8V
STEREO:5.6V MONO:0V
STEREO:0.6V MONO:5V
TUNE:5.4V
TUNE:0.65V DETUNE:0V
ON IN A MOMENT 5V
19kHz
AC28V
AC20V
AC36.2V
AC2.6V
RED
GRID
PLATE
PLATE ON
PLATE OFF
4V
−29.5V
8.4mS
1mS
3.5Vp-p
FL501 FLUORESCENT DISPLAY TUBE
1-609-563
AC 2.4V
12

NOTE: WAVEFORM DIFFERS DEPENDENT ON THE DISPLAY.

Note:
- Color code of sleeving over the end of the jacket.

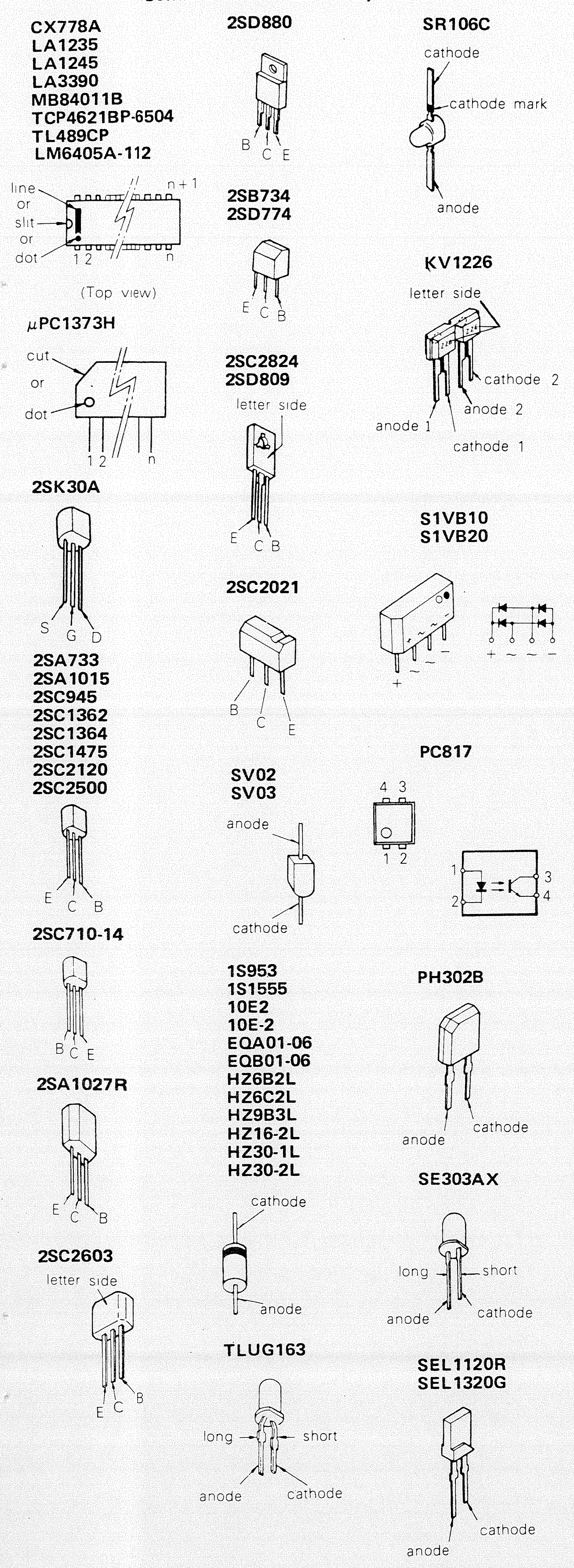

WHT
RED
(RED)(GRY)

- ○— : parts extracted from the component side.
- ■ : part mounted on the conductor side.
- [ ]← : indicates side identified with part number.
- Ⓕ : fusible resistor.
- ▨ : B + pattern
- ▩ : B − pattern
- ━━➔━━ : signal path
- ━━━ ━ ━➔ : L-CH signal path
- ━━━ ━ ━ ━➔ : R-CH signal path

4-2. MOUNTING DIAGRAM – TUNER BOARD –

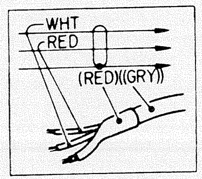
— Component Side —

- **Semiconductor Lead Layouts**

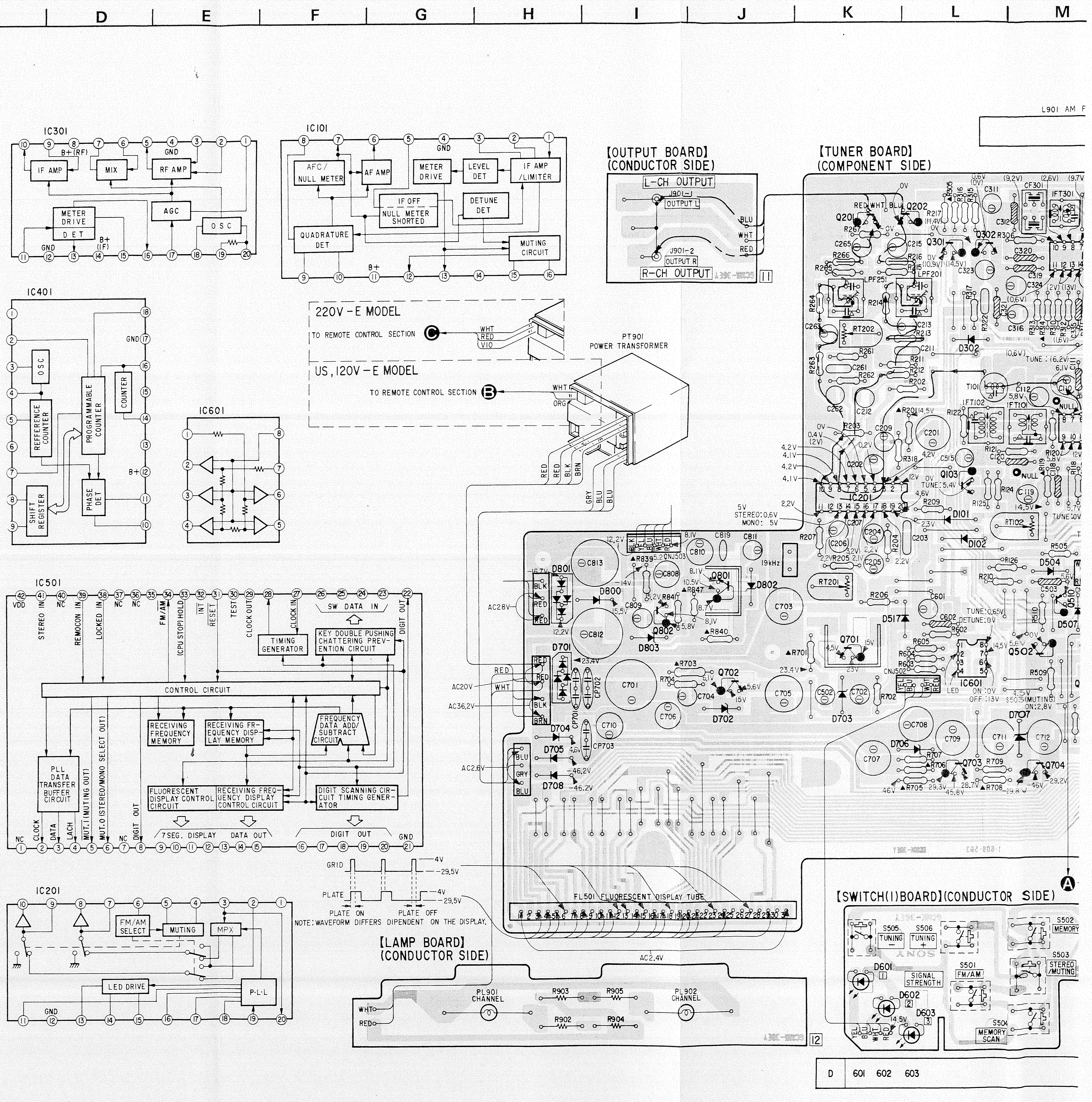

CX778A
LA1235
LA1245
LA3390
MB84011B
TCP4621BP-6504
TL489CP
LM6405A-112
line or slit or dot
1 2 n
n+1
(Top view)
µPC1373H
cut or dot
1 2 n
2SK30A
S G D
2SA733
2SA1015
2SC945
2SC1362
2SC1364
2SC1475
2SC2120
2SC2500
E C B
2SC710-14
B C E
2SA1027R
E C B
2SC2603
letter side
E C B
2SD880
B C E
2SB734
2SD774
E C B
2SC2824
2SD809
letter side
E C B
2SC2021
B C E
SV02
SV03
anode
cathode
1S953
1S1555
10E2
10E-2
EQA01-06
EQB01-06
HZ6B2L
HZ6C2L
HZ9B3L
HZ16-2L
HZ30-1L
HZ30-2L
cathode
anode
TLUG163
long
short
anode
cathode
SR106C
cathode
cathode mark
anode
KV1226
letter side
cathode 2
anode 2
anode 1
cathode 1
S1VB10
S1VB20
+ ~ − ~
PC817
4 3
1 2
PH302B
anode
cathode
SE303AX
long
short
anode
cathode
SEL1120R
SEL1320G
cathode
anode

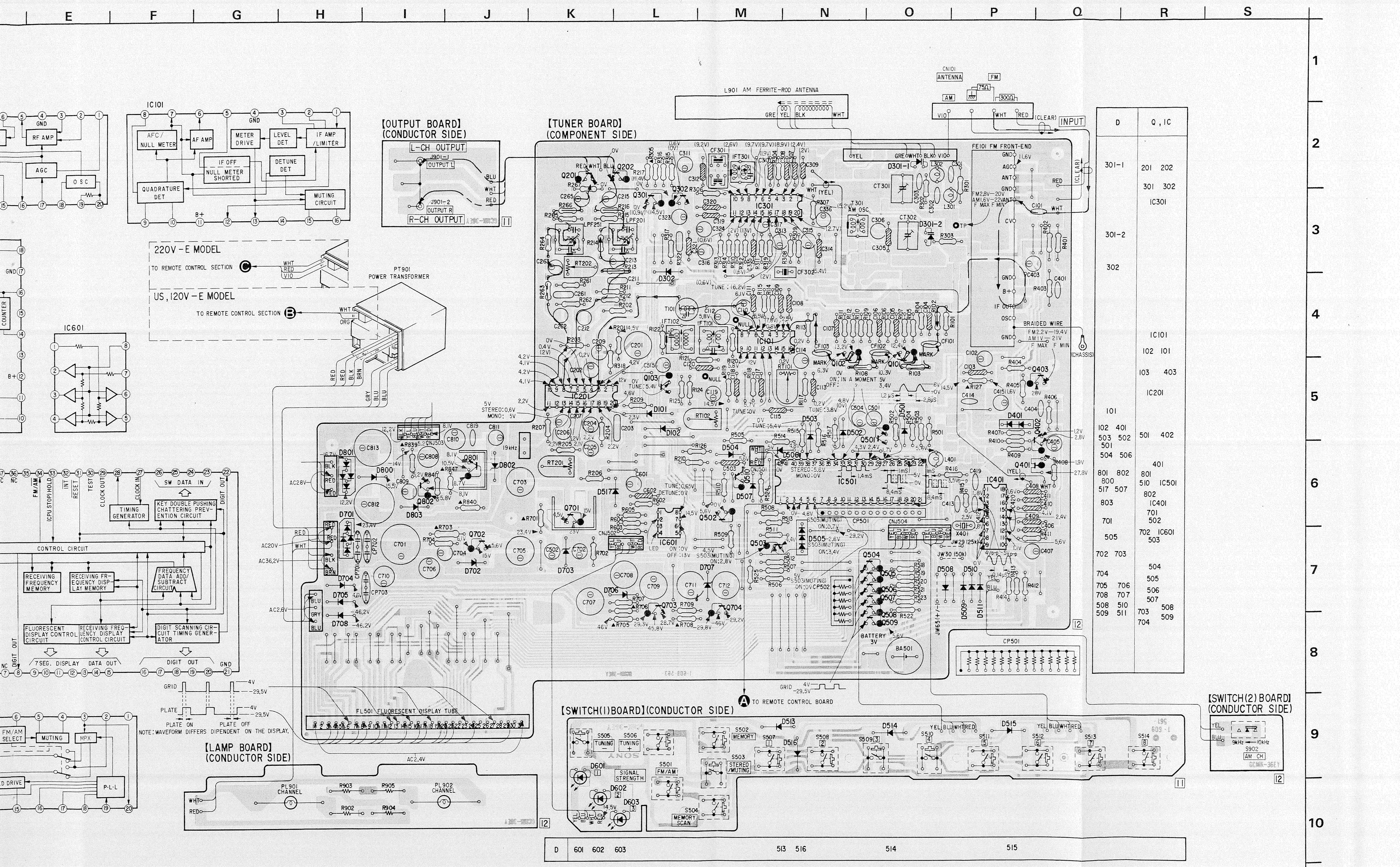
Note:

- Color code of sleeving over the end of the jacket.

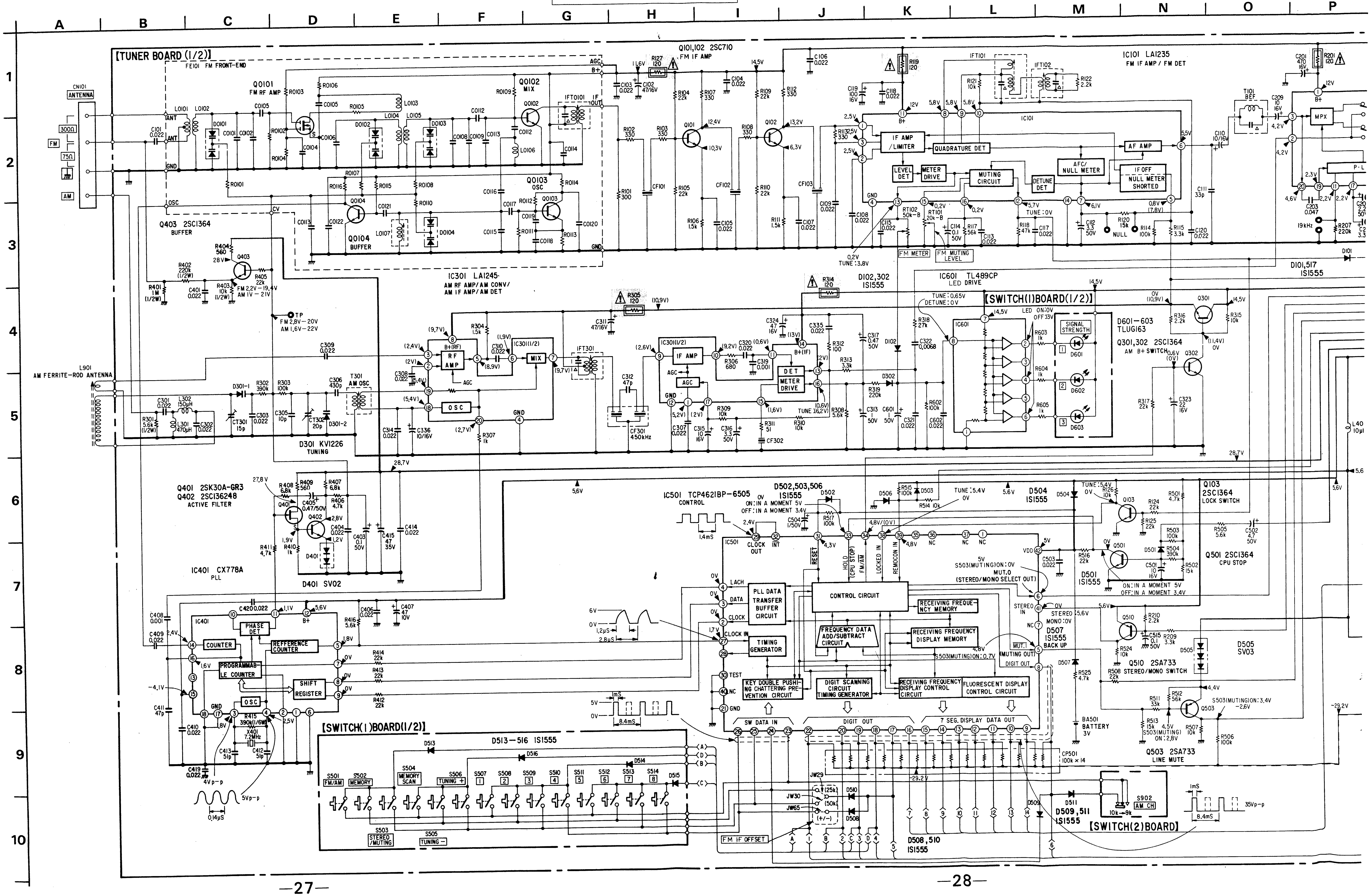

WHT
RED
(RED)(GRY)

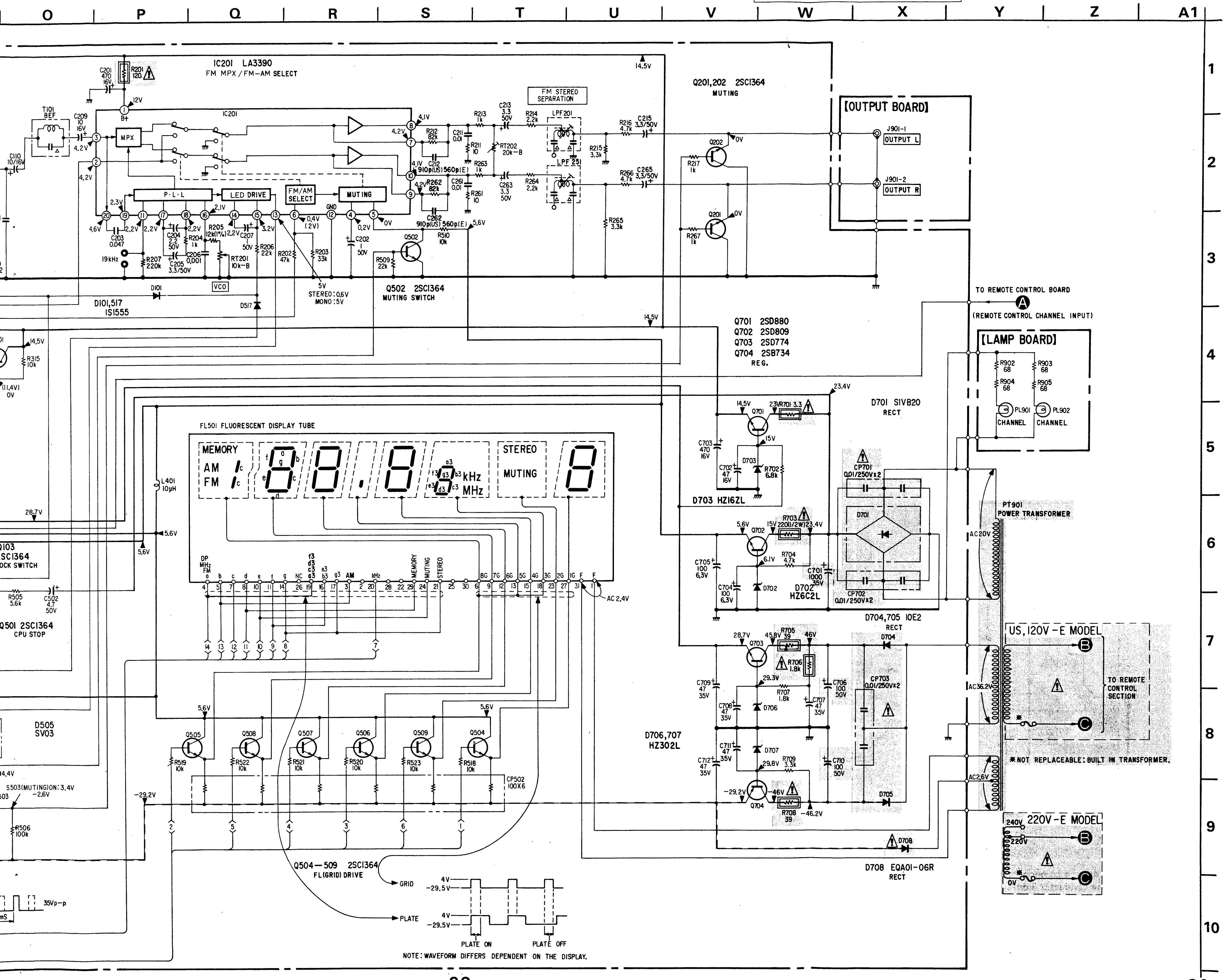
- ○— : parts extracted from the component side.
- ■ : part mounted on the conductor side.
- [⋅]← : indicates side identified with part number.
- Ⓕ : fusible resistor.
- ▨ : B + pattern
- ▨ : B − pattern
- ━▶ : signal path
- ━▶ : L-CH signal path
- ━▶ : R-CH signal path


A
B
C
D
E
F
G
H
I
J
K
L
M
1
2
3
4
5
6
7
8
9
10
IC301
B+(RF)
GND
IF AMP
MIX
RF AMP
AGC
METER DRIVE DET
B+ (IF)
OSC
IC101
GND
AFC/NULL METER
AF AMP
METER DRIVE
LEVEL DET
IF AMP /LIMITER
IF OFF NULL METER SHORTED
DETUNE DET
QUADRATURE DET
MUTING CIRCUIT
B+
IC401
GND
OSC
REFFERENCE COUNTER
PROGRAMMABLE COUNTER
COUNTER
B+
SHIFT REGISTER
PHASE DET
IC601
IC501
VDD
STEREO IN
NC
REMOCON IN
LOCKED IN
NC
FM/AM
(CPU STOP) HOLD
INT
RESET
TEST
CLOCK OUT
CLOCK IN
SW DATA IN
DIGIT OUT
TIMING GENERATOR
KEY DOUBLE PUSHING CHATTERING PREVENTION CIRCUIT
CONTROL CIRCUIT
RECEIVING FREQUENCY MEMORY
RECEIVING FREQUENCY DISPLAY MEMORY
FREQUENCY DATA ADD/SUBTRACT CIRCUIT
PLL DATA TRANSFER BUFFER CIRCUIT
FLUORESCENT DISPLAY CONTROL CIRCUIT
RECEIVING FREQUENCY DISPLAY CONTROL CIRCUIT
DIGIT SCANNING CIRCUIT TIMING GENERATOR
NC
CLOCK
DATA
LACH
MUT. (MUTING OUT)
MUT. O (STEREO/MONO SELECT OUT)
DIGIT OUT
7SEG. DISPLAY
DATA OUT
DIGIT OUT
GND
IC201
FM/AM SELECT
MUTING
MPX
LED DRIVE
P·L·L
GND
【OUTPUT BOARD】(CONDUCTOR SIDE)
L-CH OUTPUT
J901-1 OUTPUT L
J901-2 OUTPUT R
R-CH OUTPUT
BLU
WHT
RED
11
【TUNER BOARD】(COMPONENT SIDE)
L901 AM F
220V-E MODEL
TO REMOTE CONTROL SECTION Ⓒ
WHT RED VIO
US, 120V-E MODEL
TO REMOTE CONTROL SECTION Ⓑ
PT901 POWER TRANSFORMER
WHT
ORG
RED RED BLK BRN
GRY BLU BLU
AC28V
AC20V
AC36,2V
AC2,6V
12,2V
D801
D800
D803
D701
D704
D705
D708
D702
D703
D706
D707
D802
D507
D504
D517
D101
D102
D302
Q201
Q202
Q301
Q302
Q801
Q802
Q701
Q702
Q703
Q704
Q103
Q502
IC201
IC601
IFT101
IFT102
IFT301
T101
CF301
LPF201
LPF251
RT201
RT202
RT101
RT102
C701
C703
C705
C706
C707
C708
C709
C710
C711
C712
C812
C813
C810
C811
C819
NULL
TUNE
STEREO: 0.6V
MONO: 5V
19kHz
GRID
PLATE
−4V
−29,5V
PLATE ON
PLATE OFF
NOTE: WAVEFORM DIFFERS DIPENDENT ON THE DISPLAY.
FL501 FLUORESCENT DISPLAY TUBE
【LAMP BOARD】(CONDUCTOR SIDE)
PL901 CHANNEL
PL902 CHANNEL
R903
R905
R902
R904
WHT
RED
12
AC2,4V
Ⓐ
【SWITCH(1)BOARD】(CONDUCTOR SIDE)
S505 TUNING −
S506 TUNING +
S502 MEMORY
S503 STEREO /MUTING
S501 FM/AM
S504 MEMORY SCAN
D601
SIGNAL STRENGTH
D602
D603
14.5V
D 601 602 603


E F G H I J K L M N O P Q R S
1 2 3 4 5 6 7 8 9 10
IC101
AFC/NULL METER
AF AMP
METER DRIVE
LEVEL DET
IF AMP /LIMITER
IF OFF NULL METER SHORTED
DETUNE DET
QUADRATURE DET
MUTING CIRCUIT
RF AMP
AGC
OSC
GND
B+
COUNTER
IC601
[OUTPUT BOARD] (CONDUCTOR SIDE)
L-CH OUTPUT
R-CH OUTPUT
J901-1 OUTPUT L
J901-2 OUTPUT R
[TUNER BOARD] (COMPONENT SIDE)
220V-E MODEL
TO REMOTE CONTROL SECTION C
US, 120V-E MODEL
TO REMOTE CONTROL SECTION B
PT901 POWER TRANSFORMER
WHT RED VIO ORG BLK BRN GRY BLU
L901 AM FERRITE-ROD ANTENNA
CN101 ANTENNA AM FM 75Ω 300Ω
INPUT (CLEAR)
FE101 FM FRONT-END
BRAIDED WIRE
FM 2.2V–19.4V AM 1V–21V F MAX F MIN
(CHASSIS)
IC301 IC101 IC201 IC501 IC401 IC601
T301 AM OSC
TUNE: 6.2V
STEREO: 0.6V MONO: 5V
TUNE: 5.4V
MARK
ON: IN A MOMENT 5V OFF: 3.4V
S503 (MUTING) ON: 0.7V
S503 (MUTING) ON: 3.4V
S503 (MUTING) ON: 0V
BATTERY 3V
BA501
CP501
CP502
19kHz
SW DATA IN
TIMING GENERATOR
KEY DOUBLE PUSHING CHATTERING PREVENTION CIRCUIT
CONTROL CIRCUIT
RECEIVING FREQUENCY MEMORY
RECEIVING FREQUENCY DISPLAY MEMORY
FREQUENCY DATA ADD/SUBTRACT CIRCUIT
FLUORESCENT DISPLAY CONTROL CIRCUIT
RECEIVING FREQUENCY DISPLAY CONTROL CIRCUIT
DIGIT SCANNING CIRCUIT TIMING GENERATOR
7SEG. DISPLAY
DATA OUT
DIGIT OUT
CPU STOP/HOLD
INT
RESET
TEST
CLOCK OUT
CLOCK IN
FM/AM SELECT
MUTING
MPX
P-L-L
D DRIVE
GRID 4V –29.5V
PLATE 4V –29.5V
PLATE ON
PLATE OFF
NOTE: WAVEFORM DIFFERS DIPENDENT ON THE DISPLAY.
FL501 FLUORESCENT DISPLAY TUBE
[LAMP BOARD] (CONDUCTOR SIDE)
PL901 CHANNEL
PL902 CHANNEL
R903 R905 R902 R904
AC2.4V
A TO REMOTE CONTROL BOARD
[SWITCH(1) BOARD] (CONDUCTOR SIDE)
S505 TUNING –
S506 TUNING +
S502 MEMORY
S507 1
S508 2
S509 3
S510 4
S511 5
S512 6
S513 7
S514 8
S501 FM/AM
S503 STEREO /MUTING
S504 MEMORY SCAN
SIGNAL STRENGTH
D601 D602 D603
D513 D514 D515 D516
[SWITCH(2) BOARD] (CONDUCTOR SIDE)
S902 9kHz 10kHz AM CH
D | Q, IC
301-1 | 201 202
301 302
IC301
301-2
302
IC101
102 101
103 403
IC201
101
102 401 | 501 402
503 502
501
504 506
801 802 | 401
800 | 801
517 507 | 510 IC501
802
803 | IC401
701
701 | 502
702 IC601
505 | 503
702 703 | 504
704 | 505
705 706 | 506
708 707 | 507
508 510 | 703 508
509 511 | 704 509
D | 601 602 603 | 513 516 | 514 | 515

4-3. SCHEMATIC DIAGRAM – TUNER SECTION –


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
1
2
3
4
5
6
7
8
9
10
[TUNER BOARD (1/2)]
FE101 FM FRONT-END
CN101 ANTENNA
300Ω
FM
75Ω
AM
Q0101 FM RF AMP
Q0102 MIX
Q0103 OSC
Q0104 BUFFER
Q101,102 2SC710 FM IF AMP
IC101 LA1235 FM IF AMP / FM DET
IF AMP /LIMITER
QUADRATURE DET
LEVEL DET
METER DRIVE
MUTING CIRCUIT
DETUNE DET
AFC/ NULL METER
AF AMP
IF OFF NULL METER SHORTED
NULL
FM METER
FM MUTING LEVEL
T101 BEF
MPX
19kHz
Q403 2SC1364 BUFFER
IC301 LA1245 AM RF AMP/AM CONV/ AM IF AMP/AM DET
RF AMP
OSC
MIX
IF AMP
AGC
DET
METER DRIVE
L901 AM FERRITE-ROD ANTENNA
T301 AM OSC
IFT301
CF301 450kHz
CF302
D301 KV1226 TUNING
D102,302 1S1555
IC601 TL489CP LED DRIVE
[SWITCH(1)BOARD(1/2)]
SIGNAL STRENGTH
D601-603 TLUG163
Q301,302 2SC1364 AM B+ SWITCH
D101,517 1S1555
Q401 2SK30A-GR3
Q402 2SC1362 4B
ACTIVE FILTER
D401 SV02
IC401 CX778A PLL
PHASE DET
COUNTER
REFFERENCE COUNTER
PROGRAMMABLE COUNTER
SHIFT REGISTER
OSC
X401 7.2MHz
4Vp-p
5Vp-p
0.14μS
IC501 TCP4621BP-6505 CONTROL
D502,503,506 1S1555
1.4mS
CLOCK OUT
INT
RESET
HOLD (CPU STOP)
FM/AM
LOCKED IN
REMOCON IN
LACH
DATA
CLOCK
CLOCK IN
TEST
NC
GND
PLL DATA TRANSFER BUFFER CIRCUIT
TIMING GENERATOR
CONTROL CIRCUIT
RECEIVING FREQUENCY MEMORY
FREQUENCY DATA ADD/SUBTRACT CIRCUIT
RECEIVING FREQUENCY DISPLAY MEMORY
KEY DOUBLE PUSHING CHATTERING PREVENTION CIRCUIT
DIGIT SCANNING CIRCUIT TIMING GENERATOR
RECEIVING FREQUENCY DISPLAY CONTROL CIRCUIT
FLUORESCENT DISPLAY CONTROL CIRCUIT
SW DATA IN
DIGIT OUT
7 SEG. DISPLAY DATA OUT
MUTING OUT
DIGIT OUT
STEREO IN
STEREO SELECT OUT
D504 1S1555
D501 1S1555
D507 1S1555 BACK UP
BA501 BATTERY 3V
Q103 2SC1364 LOCK SWITCH
Q501 2SC1364 CPU STOP
Q510 2SA733 STEREO/MONO SWITCH
Q503 2SA733 LINE MUTE
D505 SV03
CP501 100k × 14
D509,511 1S1555
D508,510 1S1555
S902 AM CH
[SWITCH(2)BOARD]
[SWITCH(1)BOARD(1/2)]
D513-516 1S1555
S501 FM/AM
S502 MEMORY
S504 MEMORY SCAN
S506 TUNING +
S507 1
S508 2
S509 3
S510 4
S511 5
S512 6
S513 7
S514 8
S503 STEREO /MUTING
S505 TUNING –
FM IF OFFSET
JW29
JW30
JW65
8.4mS
35Vp-p


O
P
Q
R
S
T
U
V
W
X
Y
Z
A1
1
2
3
4
5
6
7
8
9
10
IC201 LA3390
FM MPX / FM–AM SELECT
IC201
MPX
P·L·L
LED DRIVE
FM/AM SELECT
MUTING
VCO
FM STEREO SEPARATION
LPF 201
LPF 251
RT202 20k–B
RT201 10k–B
T101 BEF
19kHz
STEREO: 0.6V
MONO: 5V
Q502 2SC1364
MUTING SWITCH
D101,517
1S1555
Q201,202 2SC1364
MUTING
[OUTPUT BOARD]
J901-1
OUTPUT L
J901-2
OUTPUT R
TO REMOTE CONTROL BOARD
A
(REMOTE CONTROL CHANNEL INPUT)
[LAMP BOARD]
R902 68
R903 68
R904 68
R905 68
PL901 CHANNEL
PL902 CHANNEL
Q701 2SD880
Q702 2SD809
Q703 2SD774
Q704 2SB734
REG.
D701 S1VB20
RECT
D703 HZ16ZL
D702 HZ6C2L
CP701 0.01/250V×2
CP702 0.01/250V×2
CP703 0.01/250V×2
D704,705 10E2
RECT
D706,707
HZ302L
D708 EQA01–06R
RECT
PT901
POWER TRANSFORMER
AC20V
AC36.2V
AC2.6V
US, 120V–E MODEL
B
C
TO REMOTE CONTROL SECTION
※NOT REPLACEABLE: BUILT IN TRANSFORMER.
220V–E MODEL
240V
220V
0V
FL501 FLUORESCENT DISPLAY TUBE
MEMORY
AM
FM
STEREO
MUTING
kHz
MHz
L401 10μH
Q503 2SC1364
LOCK SWITCH
Q501 2SC1364
CPU STOP
D505
SV03
S503(MUTING)ON: 3.4V
–2.6V
Q504–509 2SC1364
FL(GRID) DRIVE
CP502 100X6
GRID
PLATE
PLATE ON
PLATE OFF
NOTE: WAVEFORM DIFFERS DEPENDENT ON THE DISPLAY.
35Vp-p
AC 2.4V

Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼ W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- △ : internal component.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ——: B+ bus.
- – – –: B– bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (50 kΩ/V).
  No Mark: FM
  ( ): AM
- Voltage variations may be noted due to normal production tolerances.
- Switch

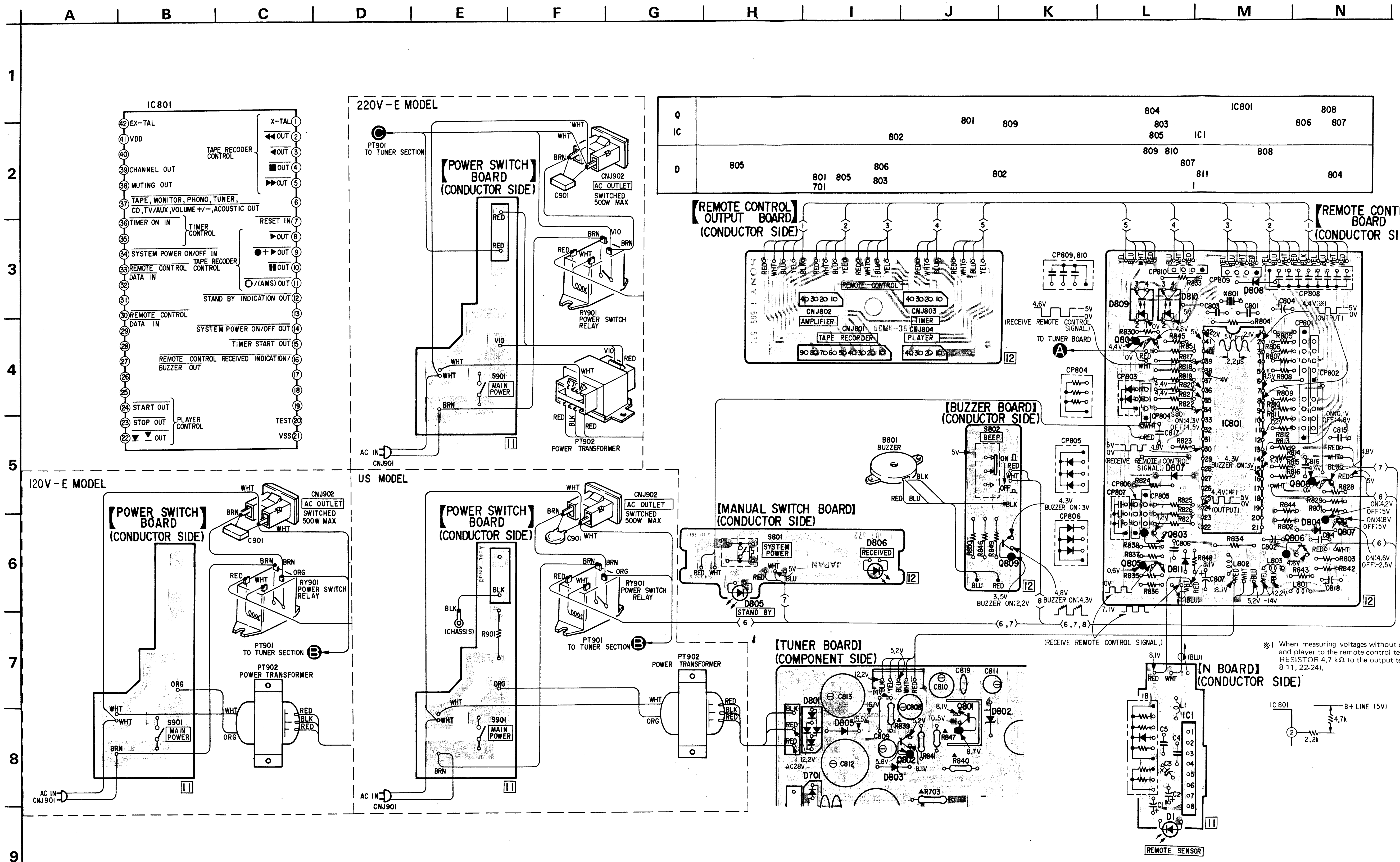
Ref. No.	Switch	Position
S501	FM/AM	OFF
S502	MEMORY	OFF
S503	STEREO/MUTING	OFF
S504	MEMORY SCAN	OFF
S505	TUNING +	OFF
S506	TUNING –	OFF
S507	1	OFF
S508	2	OFF
S509	3	OFF
S510	4	OFF
S511	5	OFF
S512	6	OFF
S513	7	OFF
S514	8	OFF
S801	SYSTEM POWER	OFF
S802	BEEP	ON
S901	MAIN POWER	OFF

Note: Voltages are measured with a VOM (50kΩ/V).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

4-4. MOUNTING DIAGRAM

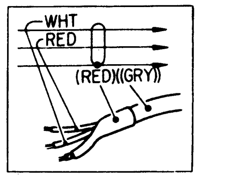
– REMOTE CONTROL/POWER SUPPLY SECTION –


A
B
C
D
E
F
G
H
I
J
K
L
M
N
1
2
3
4
5
6
7
8
9
IC801
EX-TAL
VDD
CHANNEL OUT
MUTING OUT
TAPE, MONITOR, PHONO, TUNER, CD, TV/AUX, VOLUME +/–, ACOUSTIC OUT
TIMER ON IN
TIMER CONTROL
SYSTEM POWER ON/OFF IN
REMOTE CONTROL DATA IN
X-TAL
TAPE RECODER CONTROL
RESET IN
STAND BY INDICATION OUT
SYSTEM POWER ON/OFF OUT
TIMER START OUT
REMOTE CONTROL RECEIVED INDICATION/ BUZZER OUT
START OUT
STOP OUT
PLAYER CONTROL
TEST
VSS
220V – E MODEL
120V – E MODEL
US MODEL
PT901 TO TUNER SECTION
POWER SWITCH BOARD (CONDUCTOR SIDE)
CNJ902 AC OUTLET SWITCHED 500W MAX
C901
RY901 POWER SWITCH RELAY
S901 MAIN POWER
PT902 POWER TRANSFORMER
AC IN CNJ901
(CHASSIS)
R901
REMOTE CONTROL OUTPUT BOARD (CONDUCTOR SIDE)
REMOTE CONTROL BOARD (CONDUCTOR SIDE)
CNJ802 AMPLIFIER
CNJ801 TAPE RECORDER
CNJ803 TIMER
CNJ804 PLAYER
REMOTE CONTROL
(RECEIVE REMOTE CONTROL SIGNAL.)
TO TUNER BOARD
BUZZER BOARD (CONDUCTOR SIDE)
S802 BEEP
B801 BUZZER
MANUAL SWITCH BOARD (CONDUCTOR SIDE)
S801 SYSTEM POWER
D806 RECEIVED
D805 STAND BY
TUNER BOARD (COMPONENT SIDE)
N BOARD (CONDUCTOR SIDE)
D1 REMOTE SENSOR
IC801
B+ LINE (5V)
4.7k
2.2k
CP801
CP802
CP804
CP805
CP806
CP807
CP809, 810
Q
IC
D

※1 When measuring voltages without connecting tape recorder and player to the remote control terminals, connect PULL-UP RESISTOR 4.7 kΩ to the output terminals of IC 801 (2-5, 8-11, 22-24).

Note:

- Color code of sleeving over the end of the jacket.


WHT
RED
(RED)(GRY)

- ○—: parts extracted from the component side.
- ■ : part mounted on the conductor side.
- [ ]←: indicates side identified with part number.
- Ⓕ : fusible resistor.
- ▨ : B+ pattern
- ▨ : B– pattern

- ━━➡━━ : signal path
- ━━━━➡ : L-CH signal path
- ━━ ━━➡ : R-CH signal path

4-5.

4-5. SCHEMATIC DIAGRAM

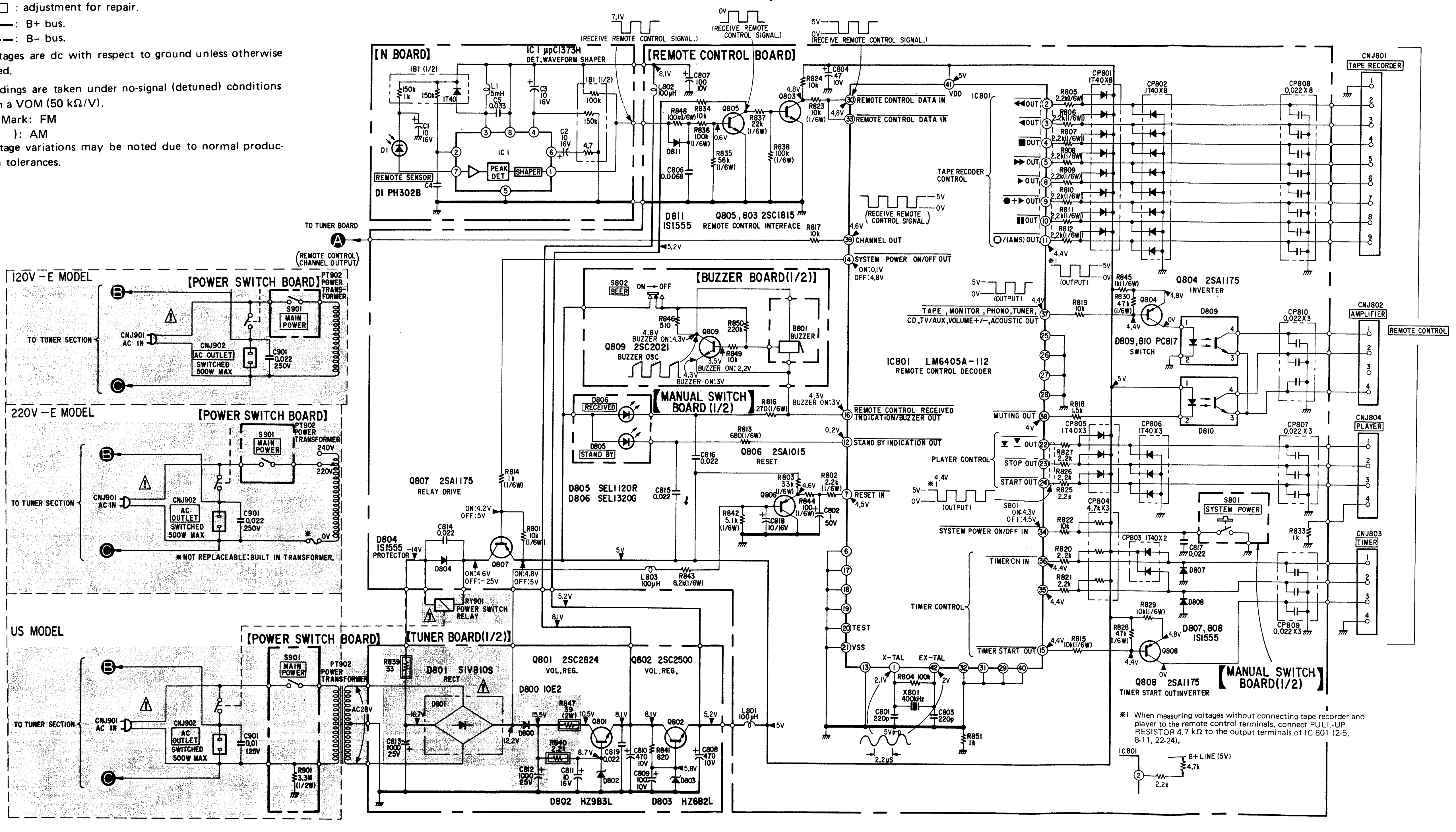
– REMOTE CONTROL/POWER SUPPLY SECTION –

Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼ W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- △ : internal component.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ——— : B+ bus.
- – – – : B– bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (50 kΩ/V).
  No Mark: FM
  ( ): AM
- Voltage variations may be noted due to normal production tolerances.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

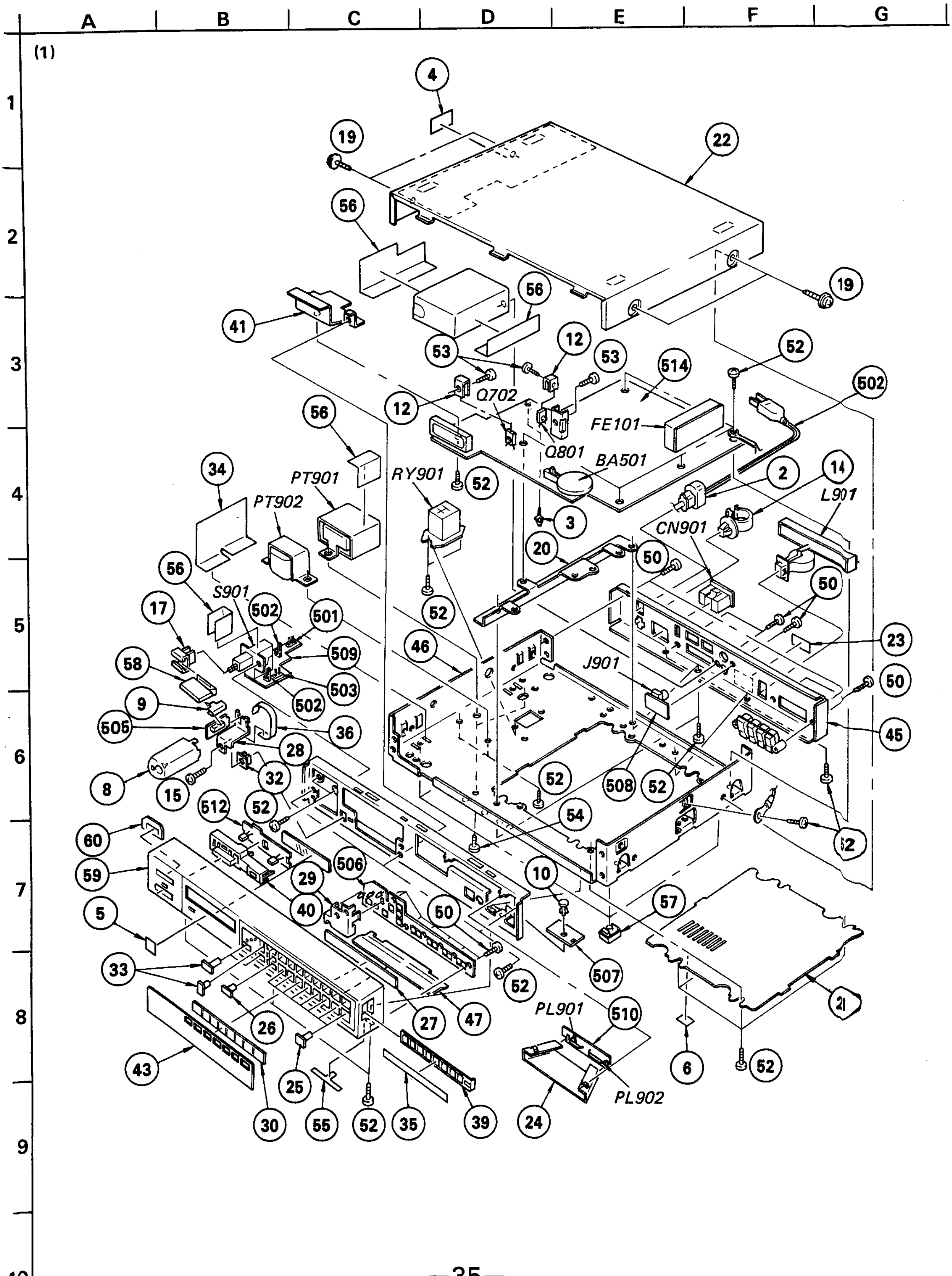
Note: Voltages are measured with a VOM (50kΩ/V).


A B C D E F G H I J K L M N
1 2 3 4 5 6 7 8 9 10
[N BOARD]
IC1 μPC1373H DET,WAVEFORM SHAPER
REMOTE SENSOR
D1 PH302B
PEAK DET
SHAPER
[REMOTE CONTROL BOARD]
(RECEIVE REMOTE CONTROL SIGNAL)
D811 IS1555
Q805, 803 2SC1815 REMOTE CONTROL INTERFACE
TO TUNER BOARD
(REMOTE CONTROL CHANNEL OUTPUT)
REMOTE CONTROL DATA IN
CHANNEL OUT
SYSTEM POWER ON/OFF OUT
ON:0.1V OFF:4.8V
TAPE RECODER CONTROL
[BUZZER BOARD(1/2)]
S802 BEEP ON ⟶ OFF
Q809 2SC2021 BUZZER OSC
B801 BUZZER
[MANUAL SWITCH BOARD (1/2)]
D806 RECEIVED
D805 STAND BY
D805 SEL1120R
D806 SEL1320G
Q806 2SA1015 RESET
REMOTE CONTROL RECEIVED INDICATION/BUZZER OUT
STAND BY INDICATION OUT
RESET IN
TAPE, MONITOR, PHONO, TUNER, CD, TV/AUX, VOLUME+/–, ACOUSTIC OUT
IC801 LM6405A-112 REMOTE CONTROL DECODER
MUTING OUT
PLAYER CONTROL
STOP OUT
START OUT
SYSTEM POWER ON/OFF IN
S801 ON:4.3V OFF:4.5V
TIMER ON IN
TIMER CONTROL
TIMER START OUT
TEST
VSS
VDD
X-TAL EX-TAL
X801 400kHz
Q804 2SA1175 INVERTER
D809,810 PC817 SWITCH
S801 SYSTEM POWER
D807,808 IS1555
Q808 2SA1175 TIMER START OUTINVERTER
[MANUAL SWITCH BOARD(1/2)]
CNJ801 TAPE RECORDER
CNJ802 AMPLIFIER
REMOTE CONTROL
CNJ804 PLAYER
CNJ803 TIMER
CP801 1T40X8
CP802 1T40X8
CP808 0.022X8
CP810 0.022X3
CP807 0.022X3
CP809 0.022X3
CP805 1T40X3
CP806 1T40X3
CP804 4.7kX3
CP803 1T40X2
120V-E MODEL
[POWER SWITCH BOARD]
PT902 POWER TRANSFORMER
S901 MAIN POWER
TO TUNER SECTION
CNJ901 AC IN
CNJ902 AC OUTLET SWITCHED 500W MAX
C901 0.022 250V
220V-E MODEL
*NOT REPLACEABLE: BUILT IN TRANSFORMER.
US MODEL
C901 0.01 125V
R901 3.3M (1/2W)
Q807 2SA1175 RELAY DRIVE
D804 IS1555 PROTECTOR
RY901 POWER SWITCH RELAY
[TUNER BOARD(1/2)]
D801 S1VB10S RECT
D800 10E2
Q801 2SC2824 VOL.REG.
Q802 2SC2500 VOL.REG.
D802 HZ9B3L
D803 HZ6B2L
L801 100μH
L803 100μH
*1 When measuring voltages without connecting tape recorder and player to the remote control terminals, connect PULL-UP RESISTOR 4.7 kΩ to the output terminals of IC 801 (2-5, 8-11, 22-24).
IC801 B+ LINE (5V) 4.7k 2.2k

ecting tape recorder
als, connect PULL-UP
nals of IC 801 (2-5,

SECTION 5

EXPLODED VIEWS AND PARTS LIST


A
B
C
D
E
F
G
(1)
1
2
3
4
5
6
7
8
9
10
4
19
22
56
19
41
56
53
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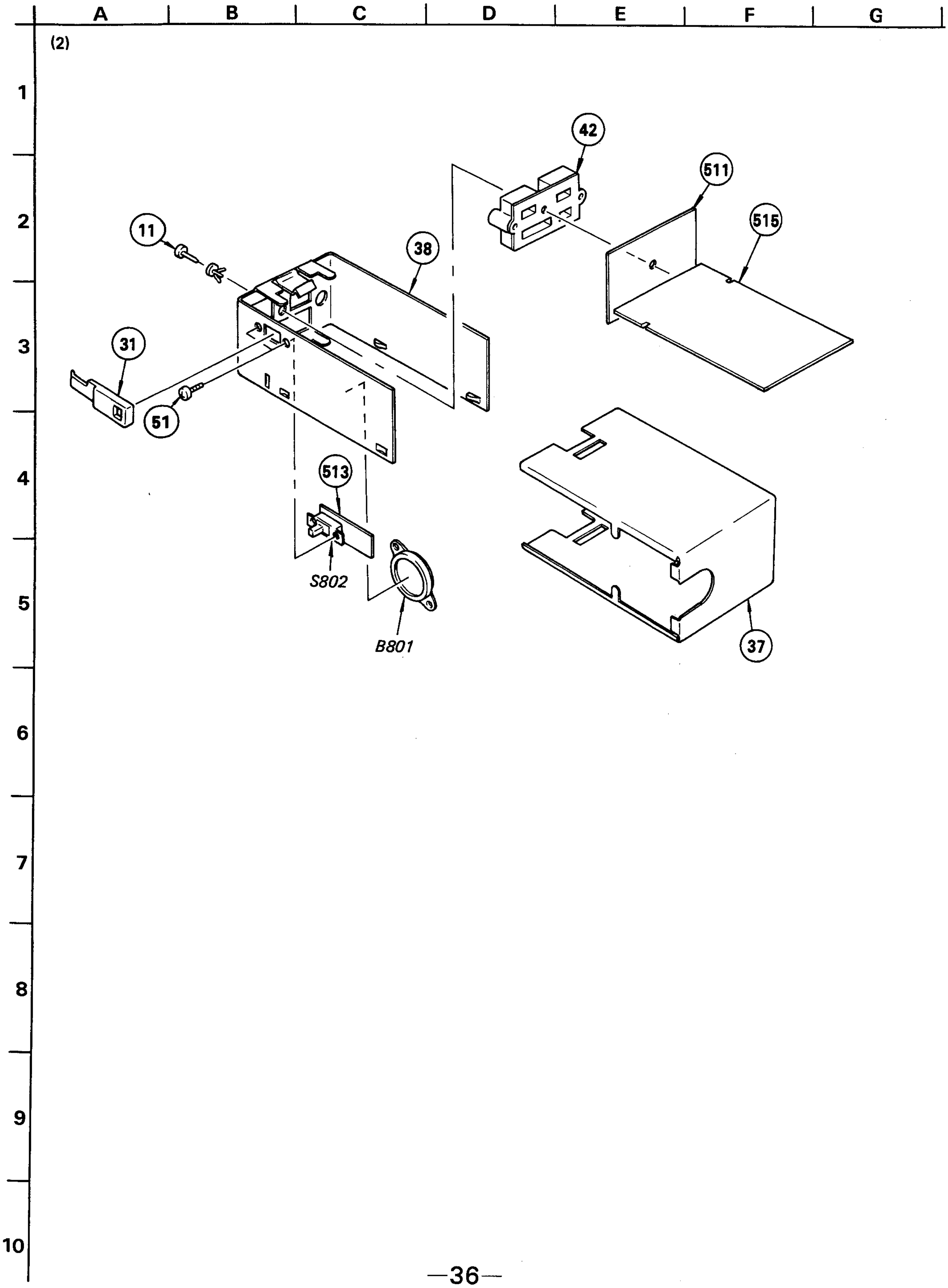
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GENERAL SECTION

No.	Part No.	Description
1	....	
2	3-703-244-00	BUSHING, CORD
3	♠;3-703-353-02	SUPPORT, PC BOARD
4	♠;3-703-677-00	(US)...LABEL, CAUTION, MAIN NEW UL
5	3-703-713-01	STICKER, SONY SYMBOL (10)
6	♠;3-703-680-00	(US)...LABEL, CAUTION, SUB, NEW UL
7	....	
8	♠;4-342-117-00	CASE, SHIELD (MAIN), R
9	♠;4-348-551-00	PLATE, SHIELD
10	4-812-134-00	RIVET NYLON, 3.5
11	4-812-134-11	RIVET NYLON, 3.5
12	♠;4-866-080-00	HEAT SINK
13	....	
14	4-869-217-00	CLIP, CORD
15	4-874-614-31	SCREW, TAPPING, BV (+) (3.5)
16	♠;4-875-327-01	HEAT SINK
17	4-875-466-00	JOINT (F2), KNOB
18	....	
19	4-886-821-11	SCREW, M3 CASE
20	♠;4-886-836-00	CHANNEL
21	♠;4-886-844-01	PLATE, BOTTOM
22	4-886-845-11	TOP COVER
23	4-886-902-00	(US).......LABEL, MODEL NUMBER
23	4-886-906-00	(220V-E)...LABEL, MODEL NUMBER
23	4-888-220-00	(120V-E)...LABEL, MODEL NUMBER
24	♠;4-886-917-00	HOUSE, LAMP
25	♠;4-886-918-00	PUSH BLOCK (A)
26	♠;4-886-919-00	PUSH BLOCK (B)
27	♠;4-886-920-00	ILLUMINATOR
28	♠;4-886-921-00	LID, SHIELD CASE
29	♠;4-886-922-00	HOLDER, LED
30	4-886-923-00	ESCUTCHEON, INDICATION PLATE
31	4-886-924-00	LINK, BUZZER
32	♠;4-886-925-00	GROMMET
33	♠;4-886-926-00	PUSH BLOCK (C)
34	♠;4-886-927-00	INSULATOR (A)
35	4-886-932-00	LABEL (E), INDICATOR
36	♠;4-886-934-00	INSULATOR (H)
37	♠;4-886-936-00	CASE (A), SHIELD
38	♠;4-886-937-00	CASE (B), SHIELD
39	4-886-938-00	HOLDER, INDICATION PLATE
40	4-886-939-00	KNOB, SYSTEM
41	♠;4-886-940-00	HOLDER, TUBE, INDICATION
42	4-886-944-00	HOLDER, CONNECTOR
43	4-886-942-00	SHEET, FUNCTION
44	♠;4-886-946-00	PANEL, SUB
45	♠;4-886-948-11	(US)...PLATE, JACK
45	♠;4-886-948-41	(E)....PLATE, JACK
46	♠;4-886-953-01	CHASSIS
47	♠;4-886-974-00	PLATE, SHIELD
48	7-685-104-14	TOTSU PTPWH 2X6 NON-SLIT, TYPE2
49	7-685-646-01	SCREW +BVTP 3X8 TYPE1
50	7-685-646-11	SCREW +BVTP 3X8 TYPE2 N-S
51	7-685-853-01	SCREW +BVTT 2X6 (S)
52	7-685-871-01	SCREW +BVTT 3X6 (S)
53	7-685-872-01	SCREW +BVTT 3X8 (S)
54	7-685-881-01	SCREW +BVTT 4X8 (S)
55	4-886-935-00	LABEL, 9K-10K
56	9-911-863-XX	INSULATOR (B)
57	X-4886-405-1	FOOT ASSY
58	X-4886-904-0	KNOB (M.P) ASSY, POWER
59	X-4886-906-1	PANEL ASSY
60	4-886-976-00	ESCUTCHEON, POWER KNOB

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CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
101	1-501-161-00	ANTENNA,FEEDER
102	1-526-565-00	(220V-E)....AC PLUG ADAPTOR
103	1-556-372-21	CORD, CONNECTION (4 CORE)
104	1-556-372-31	CORD, CONNECTION (4 CORE)
105	1-556-783-00	CORD, CONNECTION 9P
106	1-556-793-21	CORD, CONNECTION
107	2-375-002-00	SLIDER
108	2-375-012-00	BAG, POLYETHYLENE
109	3-701-630-00	BAG, POLYETHYLENE
110	3-703-390-01	(US)....INSTRUCTION
111	3-773-302-11	(E).....MANUAL, INSTRUCTION
112	3-773-302-21	(US)....MANUAL, INSTRUCTION
113 ♠	;4-875-574-00	SHEET PROTECTION
114	4-886-969-00	(E)....LABEL (F2), INDICATOR
115	4-886-970-00	(E)....LABEL (A9), INDICATOR
116	4-886-971-00	(US)....LABEL (A10), INDICATOR
117	4-886-973-00	(US)....LABEL (F1), INDICATOR
118	4-886-991-00	(E).....SPACER
119	4-886-997-00	CUSHION (RIGHT-E), UPPER
120	4-886-998-00	CUSHION (LEFT-E), UPPER
121	4-886-999-00	CUSHION (RIGHT-E), LOWER
122	4-888-044-00	(220V-E)...LABEL, CAUTION
123	4-888-045-00	(120V-E)...LABEL, CAUTION
124	4-888-201-00	CUSHION (LEFT-E), LOWER
125	4-888-202-00	INDIVIDUAL CARTON
126	4-888-219-00	SPACER, FERRITE-ROD ANTENNA
127	A-4372-011-A	COMMANDER ASSY

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
⚠501 ♠	.;1-535-135-00	BASE POST 14MM (10MM PITCH)			
⚠502 ♠	.;1-535-416-00	TERMINAL			
⚠503 ♠	.;1-535-444-00	TERMINAL			
504⚠	.1-551-472-00	(E).....CORD, POWER			
504⚠	.1-551-628-00	(US).....CORD, POWER			
505 ♠	;1-603-976-00	PC BOARD, N			
506 ♠	;1-609-561-00	PC BOARD, S-1			
507 ♠	;1-609-564-00	PC BOARD, S-2			
508 ♠	;1-609-565-00	PC BOARD, OUTPUT			
⚠509 ♠	.;1-609-566-00	PC BOARD, POWER SWITCH			
510 ♠	;1-609-567-00	PC BOARD, LAMP			
511 ♠	;1-609-571-00	PC BOARD, R OUTPUT			
512 ♠	;1-609-572-00	PC BOARD, M SWITCH			
513 ♠	;1-609-573-00	PC BOARD, B			
514 ♠	;A-4351-339-A	(US)...MOUNTED PCB, TUNER			
514 ♠	;A-4351-341-A	(E)....MOUNTED PCB, TUNER			
515 ♠	;A-4409-714-A	MOUNTED PCB, REMOTE CONTROL			
B801	1-529-014-00	BUZZER, PIEZOELECTRIC			
BA501	1-528-120-00	BATTERY, LITHIUM (CR-2025)			
C1	1-123-617-00	ELECT	10MF	20%	16V
C2	1-123-617-00	ELECT	10MF	20%	16V
C3	1-123-617-00	ELECT	10MF	20%	16V
C4	1-161-019-00	CERAMIC	0.033MF	10%	25V
C5	1-108-567-00	MYLAR	0.0033MF	5%	50V
C101	1-101-005-00	CERAMIC	0.022MF		50V
C102	1-123-319-00	ELECT	47MF	20%	16V
C103	1-161-494-00	CERAMIC	0.022MF	30%	25V
C104	1-161-494-00	CERAMIC	0.022MF	30%	25V
C105	1-161-494-00	CERAMIC	0.022MF	30%	25V
C106	1-161-494-00	CERAMIC	0.022MF	30%	25V
C107	1-161-494-00	CERAMIC	0.022MF	30%	25V
C108	1-161-494-00	CERAMIC	0.022MF	30%	25V
C109	1-161-494-00	CERAMIC	0.022MF	30%	25V
C110	1-123-356-00	ELECT	10MF	20%	16V
C111	1-161-265-00	CERAMIC	33PF	5%	50V
C112	1-123-354-00	ELECT	3.3MF	20%	50V
C113	1-161-494-00	CERAMIC	0.022MF	30%	25V
C114	1-123-607-00	ELECT	0.1MF	20%	50V
C115	1-161-494-00	CERAMIC	0.022MF	30%	25V
C117	1-161-494-00	CERAMIC	0.022MF	30%	25V
C118	1-161-494-00	CERAMIC	0.022MF	30%	25V
C119	1-123-320-00	ELECT	100MF	20%	16V
C120	1-161-494-00	CERAMIC	0.022MF	30%	25V

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CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C201	1-123-323-00	ELECT	470MF	20%	16V
C202	1-123-380-00	ELECT	1MF	20%	50V
C203	1-108-246-00	MYLAR	0.047MF	10%	50V
C204	1-123-353-00	ELECT	2.2MF	20%	50V
C205	1-123-354-00	ELECT	3.3MF	20%	50V
C206	1-104-077-00	POLYSTYRENE	0.001MF	5%	50V
C207	1-123-380-00	ELECT	1MF	20%	50V
C209	1-123-356-00	ELECT	10MF	20%	16V
C211	1-108-239-00	MYLAR	0.01MF	10%	50V
C212	1-104-071-00	(E)....CAP, STYROL	560PF	5%	50V
C212	1-104-075-00	(US)...POLYSTYRENE	820PF	5%	50V
C213	1-123-354-00	ELECT	3.3MF	20%	50V
C215	1-123-354-00	ELECT	3.3MF	20%	50V
C261	1-108-239-00	MYLAR	0.01MF	10%	50V
C262	1-104-075-00	(US)...POLYSTYRENE	820PF	5%	50V
C262	1-104-071-00	(E)....CAP, STYROL	560PF	5%	50V
C263	1-123-354-00	ELECT	3.3MF	20%	50V
C265	1-123-354-00	ELECT	3.3MF	20%	50V
C301	1-101-005-00	CERAMIC	0.022MF		50V
C302	1-101-005-00	CERAMIC	0.022MF		50V
C303	1-101-005-00	CERAMIC	0.022MF		50V
C305	1-161-259-00	CERAMIC	10PF	5%	50V
C306	1-103-716-00	POLYSTYRENE	430PF	5%	50V
C307	1-161-494-00	CERAMIC	0.022MF	30%	25V
C308	1-161-494-00	CERAMIC	0.022MF	30%	25V
C309	1-161-494-00	CERAMIC	0.022MF	30%	25V
C310	1-161-494-00	CERAMIC	0.022MF	30%	25V
C311	1-123-319-00	ELECT	47MF	20%	16V
C312	1-161-267-00	CERAMIC	47PF	5%	50V
C313	1-123-380-00	ELECT	1MF	20%	50V
C314	1-161-494-00	CERAMIC	0.022MF	30%	25V
C315	1-123-356-00	ELECT	10MF	20%	16V
C316	1-123-354-00	ELECT	3.3MF	20%	50V
C317	1-123-351-00	ELECT	0.47MF	20%	50V
C319	1-161-323-00	CERAMIC	0.001MF	10%	50V
C320	1-161-494-00	CERAMIC	0.022MF	30%	25V
C321	1-161-494-00	CERAMIC	0.022MF	30%	25V
C322	1-108-237-00	MYLAR	0.0068MF	10%	50V
C323	1-123-317-00	ELECT	22MF	20%	16V
C324	1-123-319-00	ELECT	47MF	20%	16V
C335	1-161-494-00	CERAMIC	0.022MF	30%	25V
C336	1-123-356-00	ELECT	10MF	20%	16V
C401	1-101-005-00	CERAMIC	0.022MF		50V
C403	1-123-607-00	ELECT	0.1MF	20%	50V
C404	1-101-005-00	CERAMIC	0.022MF		50V
C405	1-123-351-00	ELECT	0.47MF	20%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C406	1-161-494-00	CERAMIC	0.022MF	30%	25V
C407	1-123-306-00	ELECT	47MF	20%	10V
C408	1-161-323-00	CERAMIC	0.001MF	10%	50V
C409	1-161-494-00	CERAMIC	0.022MF	30%	25V
C410	1-161-494-00	CERAMIC	0.022MF	30%	25V
C411	1-161-267-00	CERAMIC	47PF	5%	50V
C412	1-102-522-00	CERAMIC	51PF	5%	50V
C413	1-102-522-00	CERAMIC	51PF	5%	50V
C414	1-101-005-00	CERAMIC	0.022MF		50V
C415	1-123-359-00	ELECT	47MF	20%	35V
C416	1-123-607-00	ELECT	0.1MF	20%	50V
C417	1-123-351-00	ELECT	0.47MF	20%	50V
C418	1-123-351-00	ELECT	0.47MF	20%	50V
C419	1-101-005-00	CERAMIC	0.022MF		50V
C420	1-101-005-00	CERAMIC	0.022MF		50V
C501	1-123-356-00	ELECT	10MF	20%	16V
C502	1-123-369-00	ELECT	4.7MF	20%	50V
C503	1-161-494-00	CERAMIC	0.022MF	30%	25V
C504	1-123-380-00	ELECT	1MF	20%	50V
C515	1-123-607-00	ELECT	0.1MF	20%	50V
C601	1-123-380-00	ELECT	1MF	20%	50V
C602	1-161-494-00	CERAMIC	0.022MF	30%	25V
C701 ⚠	1-123-508-00	ELECT	1000MF	20%	35V
C702	1-123-319-00	ELECT	47MF	20%	16V
C703	1-123-323-00	ELECT	470MF	20%	16V
C704	1-123-295-00	ELECT	100MF	20%	6.3V
C705	1-123-295-00	ELECT	100MF	20%	6.3V
C706 ⚠	1-123-513-00	ELECT	100MF	20%	50V
C707	1-123-359-00	ELECT	47MF	20%	35V
C708	1-123-359-00	ELECT	47MF	20%	35V
C709	1-123-359-00	ELECT	47MF	20%	35V
C710 ⚠	1-123-513-00	ELECT	100MF	20%	50V
C711	1-123-359-00	ELECT	47MF	20%	35V
C712	1-123-359-00	ELECT	47MF	20%	35V
C801	1-102-110-00	CERAMIC	220PF	10%	50V
C802	1-123-380-00	ELECT	1MF	20%	50V
C803	1-102-110-00	CERAMIC	220PF	10%	50V
C804	1-123-306-00	ELECT	47MF	20%	10V
C806	1-108-237-00	MYLAR	0.0068MF	10%	50V
C807	1-123-474-00	ELECT	100MF	20%	10V
C808	1-123-477-00	ELECT	470MF	20%	10V
C809	1-123-474-00	ELECT	100MF	20%	10V
C810	1-123-477-00	ELECT	470MF	20%	10V
C811	1-123-356-00	ELECT	10MF	20%	16V
C812 ⚠	1-123-498-00	ELECT	1000MF	20%	25V

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UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C813	1-123-498-00	ELECT	1000MF	20%	25V
C814	1-101-005-00	CERAMIC	0.022MF		50V
C815	1-101-005-00	CERAMIC	0.022MF		50V
C816	1-101-005-00	CERAMIC	0.022MF		50V
C817	1-101-005-00	CERAMIC	0.022MF		50V
C818	1-101-005-00	CERAMIC	0.022MF		50V
C901 ⚠.	1-130-456-00	(E)....CAP, FILM	0.022MF	20%	250V
C901 ⚠.	1-161-749-00	(US)...CAP, CERAMIC	10000PF		125V
CF101	1-527-964-00	FILTER, CERAMIC			
CF102	1-527-964-00	FILTER, CERAMIC			
CF103	1-527-964-00	FILTER, CERAMIC			
CF301	1-527-937-00	FILTER, CERAMIC			
CF302	1-527-981-00	FILTER, CERAMIC			
CN101	1-536-705-41	TERMINAL BOARD (SP)			
♦CNJ501;	1-560-060-00	PIN, CONNECTOR 2P			
♦CNJ502;	1-560-062-00	PIN, CONNECTOR 4P			
♦CNJ503;	1-560-063-00	PIN, CONNECTOR 5P			
♦CNJ504;	1-560-065-00	PIN, CONNECTOR 8P			
♦CNJ801;	1-560-263-00	CONNECTOR PIN 9P			
♦CNJ802;	1-560-039-00	PIN, CONNECTOR			
⚠♦CNJ803;	1-560-039-00	PIN, CONNECTOR			
⚠♦CNJ804;	1-560-039-00	PIN, CONNECTOR			
⚠ CNJ902	1-526-609-00	CONNECTOR, AC OUTLET			
CP502	1-231-849-00	COMPOSITION CIRCUIT BLOCK			
⚠ CP701	1-102-394-00	CERAMIC			250V
⚠ CP702	1-102-394-00	CERAMIC			250V
⚠ CP703	1-102-394-00	CERAMIC			250V
CP803	1-231-908-00	COMPOSITION CIRCUIT BLOCK			
CP804	1-231-810-00	COMPOSITION CIRCUIT BLOCK			
CP805	1-232-256-00	COMPOSITION CIRCUIT BLOCK			
CP806	1-232-096-00	COMPOSITION CIRCUIT BLOCK			
CT301	1-141-180-00	CAP, TRIMMER 15P			
CT302	1-141-171-00	CAP, TRIMMER 20P			
D101	8-719-815-55	DIODE 1S1555			
D102	8-719-815-55	DIODE 1S1555			
D301	8-719-912-27	DIODE KV1226			
D302	8-719-912-27	DIODE KV1226			
D303	8-719-912-27	DIODE KV1226			
D401	8-719-300-02	DIODE SV02			
D402	8-719-300-02	DIODE SV02			
D501	8-719-815-55	DIODE 1S1555			
D502	8-719-815-55	DIODE 1S1555			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D503	8-719-815-55	DIODE 1S1555
D504	8-719-815-55	DIODE 1S1555
D505	8-719-300-03	DIODE SV03
D506	8-719-815-55	DIODE 1S1555
D507	8-719-815-55	DIODE 1S1555
D508	8-719-815-55	DIODE 1S1555
D509	8-719-815-55	DIODE 1S1555
D510	8-719-815-55	DIODE 1S1555
D511	8-719-815-55	DIODE 1S1555
D513	8-719-815-55	DIODE 1S1555
D514	8-719-815-55	DIODE 1S1555
D515	8-719-815-55	DIODE 1S1555
D516	8-719-815-55	DIODE 1S1555
D517	8-719-815-55	DIODE 1S1555
D601	8-719-800-14	DIODE TLUG163
D602	8-719-800-14	DIODE TLUG163
D603	8-719-800-14	DIODE TLUG163
D701 ⚠	8-719-511-20	DIODE S1VB20
D702	8-719-910-68	DIODE HZ6C2L
D703	8-719-901-62	DIODE HZ16-2L
D704 ⚠	8-719-200-02	DIODE 10E2
D705 ⚠	8-719-200-02	DIODE 10E2
D706	8-719-913-02	DIODE HZ30-2L
D707	8-719-913-02	DIODE HZ30-2L
D708 ⚠	8-719-931-06	DIODE EQA01-06
D800	8-719-200-02	DIODE 10E2
D801	8-719-511-20	DIODE S1VB20
D802	8-719-910-96	DIODE HZ9B3L
D803	8-719-910-68	DIODE HZ6B2L
D804	8-719-815-55	DIODE 1S1555
D805	8-719-311-20	DIODE SEL1120R
D806	8-719-313-20	DIODE SEL1320G
D807	8-719-815-55	DIODE 1S1555
D808	8-719-815-55	DIODE 1S1555
D809	8-719-902-56	DIODE PC817
D810	8-719-902-56	DIODE PC817
D811	8-719-815-55	DIODE 1S1555
D834	8-719-110-32	DIODE PH302B
D836	8-719-200-02	DIODE 10E2
D904	8-719-311-20	DIODE SEL1120R
D905	8-719-313-20	DIODE SEL1320G
FE101	A-4344-031-A	FM FRONTEND

NOTE:

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- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description
FL501	1-519-263-00	INDICATOR TUBE, FLUORESCENT
IB1	1-232-004-00	COMPOSITION CIRCUIT BLOCK
IC101	8-759-812-35	IC LA1235
IC201	8-759-833-90	IC LA3390
IC301	8-759-812-45	IC LA1245
IC401	8-759-617-78	IC CX778A
IC501	8-759-201-26	IC TC4621BP-6505
IC601	8-759-904-89	IC TL489CP
IC801	8-759-800-50	IC LM6405A-112
IC802	8-759-113-73	IC UPC1373H
IFT101	1-404-327-00	TRANSFORMER, DISCRIMINATOR
IFT102	1-404-328-00	TRANSFORMER, DISCRIMINATOR
IFT301	1-404-413-00	TRANSFORMER, IF
J901	1-507-843-00	JACK, PIN 2P
L1	1-404-310-00	COIL
L101	1-404-310-00	COIL
L301	1-407-177-XX	MICRO INDUCTOR 470UH
L302	1-407-171-XX	MICRO INDUCTOR 150UH
L303	1-407-173-XX	MICRO INDUCTOR 220UH
L401	1-407-157-XX	MICRO INDUCTOR 10UH
L801	1-407-169-XX	MICRO INDUCTOR 100UH
L802	1-407-169-XX	MICRO INDUCTOR 100UH
L803	1-407-169-XX	MICRO INDUCTOR 100UH
L901	1-402-012-00	ANTENNA, FERRITE-ROD (MW)
LPF201	1-235-164-00	FILTER, LOW PASS
LPF251	1-235-164-00	FILTER, LOW PASS
PL901	1-518-466-00	LAMP, PILOT
PL902	1-518-466-00	LAMP, PILOT
⚠PT901	.1-447-500-00	(US,120V-E)...TRANSFORMER, POWER
⚠PT901	.1-447-501-00	(220V-E)......TRANSFORMER, POWER
⚠PT902	.1-447-503-00	(US,120V-E)...TRANSFORMER, POWER
⚠PT902	.1-447-504-00	(220V-E)......TRANSFORMER, POWER
Q101	8-729-671-14	TRANSISTOR 2SC710-14
Q102	8-729-671-14	TRANSISTOR 2SC710-14
Q103	8-729-663-47	TRANSISTOR 2SC1364
Q201	8-729-663-47	TRANSISTOR 2SC1364
Q202	8-729-663-47	TRANSISTOR 2SC1364
Q301	8-729-663-47	TRANSISTOR 2SC1364
Q302	8-729-663-47	TRANSISTOR 2SC1364
Q401	8-729-203-04	TRANSISTOR 2SK30A
Q402	8-729-665-47	TRANSISTOR 2SC1362
Q403	8-729-663-47	TRANSISTOR 2SC1364
Q501	8-729-663-47	TRANSISTOR 2SC1364
Q502	8-729-663-47	TRANSISTOR 2SC1364

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
Q503	8-729-612-77	TRANSISTOR 2SA1027R				
Q504	8-729-663-47	TRANSISTOR 2SC1364				
Q505	8-729-663-47	TRANSISTOR 2SC1364				
Q506	8-729-663-47	TRANSISTOR 2SC1364				
Q507	8-729-663-47	TRANSISTOR 2SC1364				
Q508	8-729-663-47	TRANSISTOR 2SC1364				
Q509	8-729-663-47	TRANSISTOR 2SC1364				
Q510	8-729-612-77	TRANSISTOR 2SA1027R				
Q701	8-729-288-02	TRANSISTOR 2SD880				
Q702	8-729-180-93	TRANSISTOR 2SD809				
Q703	8-729-177-43	TRANSISTOR 2SD774				
Q704	8-729-103-43	TRANSISTOR 2SB734				
Q801	8-729-282-42	TRANSISTOR 2SC2824				
Q802	8-729-200-02	TRANSISTOR 2SC2500				
Q803	8-729-663-47	TRANSISTOR 2SC1364				
Q804	8-729-201-52	TRANSISTOR 2SA1015				
Q805	8-729-663-47	TRANSISTOR 2SC1364				
Q806	8-729-201-52	TRANSISTOR 2SA1015				
Q807	8-729-201-52	TRANSISTOR 2SA1015				
Q808	8-729-201-52	TRANSISTOR 2SA1015				
Q809	8-729-902-11	TRANSISTOR 2SC2021				
R101	1-246-460-00	CARBON	300	5%	1/4W	
R102	1-246-461-00	CARBON	330	5%	1/4W	
R103	1-246-461-00	CARBON	330	5%	1/4W	
R104	1-246-505-00	CARBON	22K	5%	1/4W	
R105	1-246-505-00	CARBON	22K	5%	1/4W	
R106	1-246-477-00	CARBON	1.5K	5%	1/4W	
R107	1-246-461-00	CARBON	330	5%	1/4W	
R108	1-246-461-00	CARBON	330	5%	1/4W	
R109	1-246-505-00	CARBON	22K	5%	1/4W	
R110	1-246-505-00	CARBON	22K	5%	1/4W	
R111	1-246-477-00	CARBON	1.5K	5%	1/4W	
R112	1-246-461-00	CARBON	330	5%	1/4W	
R113	1-246-461-00	CARBON	330	5%	1/4W	
R114	1-246-521-00	CARBON	100K	5%	1/4W	
R115	1-246-485-00	CARBON	3.3K	5%	1/4W	
R117	1-246-515-00	CARBON	56K	5%	1/4W	
R118	1-246-513-00	CARBON	47K	5%	1/4W	
R119⚠	.1-247-109-00	CARBON	120	5%	1/4W	F
R120	1-246-501-00	CARBON	15K	5%	1/4W	
R121	1-246-497-00	CARBON	10K	5%	1/4W	
R122	1-246-481-00	CARBON	2.2K	5%	1/4W	
R124	1-246-505-00	CARBON	22K	5%	1/4W	
R125	1-246-505-00	CARBON	22K	5%	1/4W	
R126	1-246-497-00	CARBON	10K	5%	1/4W	

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- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in µF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:µF, PF:µµF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : µH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SEMICONDUCTORS

In each case, U : µ, for example:
UA···: µA···, UPA···: µPA···, UPC···: µPC, UPD···: µPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R127 ⚠.	1-247-109-00	CARBON	120	5%	1/4W	F
R201 ⚠.	1-247-109-00	CARBON	120	5%	1/4W	F
R202	1-246-513-00	CARBON	47K	5%	1/4W	
R203	1-246-509-00	CARBON	33K	5%	1/4W	
R204	1-246-473-00	CARBON	1K	5%	1/4W	
R205	1-214-755-00	METAL	12K	1%	1/4W	
R206	1-246-505-00	CARBON	22K	5%	1/4W	
R207	1-246-529-00	CARBON	220K	5%	1/4W	
R209	1-246-485-00	CARBON	3.3K	5%	1/4W	
R210	1-246-481-00	CARBON	2.2K	5%	1/4W	
R211	1-246-425-00	CARBON	10	5%	1/4W	
R212	1-246-519-00	CARBON	82K	5%	1/4W	
R213	1-246-473-00	CARBON	1K	5%	1/4W	
R214	1-246-481-00	CARBON	2.2K	5%	1/4W	
R215	1-246-485-00	CARBON	3.3K	5%	1/4W	
R216	1-246-489-00	CARBON	4.7K	5%	1/4W	
R217	1-246-473-00	CARBON	1K	5%	1/4W	
R261	1-246-425-00	CARBON	10	5%	1/4W	
R262	1-246-519-00	CARBON	82K	5%	1/4W	
R263	1-246-473-00	CARBON	1K	5%	1/4W	
R264	1-246-481-00	CARBON	2.2K	5%	1/4W	
R265	1-246-485-00	CARBON	3.3K	5%	1/4W	
R266	1-246-489-00	CARBON	4.7K	5%	1/4W	
R267	1-246-473-00	CARBON	1K	5%	1/4W	
R301	1-244-891-00	CARBON	5.6K	5%	1/2W	
R302	1-246-535-00	CARBON	390K	5%	1/4W	
R303	1-246-521-00	CARBON	100K	5%	1/4W	
R304	1-246-477-00	CARBON	1.5K	5%	1/4W	
R305 ⚠.	1-247-109-00	CARBON	120	5%	1/4W	F
R306	1-246-469-00	CARBON	680	5%	1/4W	
R307	1-246-473-00	CARBON	1K	5%	1/4W	
R308	1-246-491-00	CARBON	5.6K	5%	1/4W	
R309	1-246-497-00	CARBON	10K	5%	1/4W	
R310	1-246-497-00	CARBON	10K	5%	1/4W	
R311	1-246-442-00	CARBON	51	5%	1/4W	
R312	1-246-449-00	CARBON	100	5%	1/4W	
R313	1-246-485-00	CARBON	3.3K	5%	1/4W	
R314 ⚠.	1-247-109-00	CARBON	120	5%	1/4W	F
R315	1-246-497-00	CARBON	10K	5%	1/4W	
R316	1-246-481-00	CARBON	2.2K	5%	1/4W	
R317	1-246-505-00	CARBON	22K	5%	1/4W	
R318	1-246-507-00	CARBON	27K	5%	1/4W	
R319	1-246-529-00	CARBON	220K	5%	1/4W	
R320	1-246-535-00	CARBON	390K	5%	1/4W	
R321	1-246-521-00	CARBON	100K	5%	1/4W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R322	1-246-505-00	CARBON	22K	5%	1/4W
R323	1-246-505-00	CARBON	22K	5%	1/4W
R324	1-246-505-00	CARBON	22K	5%	1/4W
R325	1-246-505-00	CARBON	22K	5%	1/4W
R326	1-246-497-00	CARBON	10K	5%	1/4W
R327	1-246-545-00	CARBON	1M	5%	1/4W
R328	1-246-481-00	CARBON	2.2K	5%	1/4W
R401	1-244-945-00	CARBON	1M	5%	1/2W
R402	1-244-929-00	CARBON	220K	5%	1/2W
R403	1-244-897-00	CARBON	10K	5%	1/2W
R404	1-246-467-00	CARBON	560	5%	1/4W
R405	1-246-505-00	CARBON	22K	5%	1/4W
R406	1-246-489-00	CARBON	4.7K	5%	1/4W
R407	1-246-493-00	CARBON	6.8K	5%	1/4W
R408	1-246-493-00	CARBON	6.8K	5%	1/4W
R409	1-246-467-00	CARBON	560	5%	1/4W
R410	1-246-473-00	CARBON	1K	5%	1/4W
R411	1-246-489-00	CARBON	4.7K	5%	1/4W
R412	1-246-505-00	CARBON	22K	5%	1/4W
R413	1-246-505-00	CARBON	22K	5%	1/4W
R414	1-246-505-00	CARBON	22K	5%	1/4W
R415	1-247-893-00	CARBON	390K	5%	1/6W
R416	1-246-491-00	CARBON	5.6K	5%	1/4W
R417	1-246-493-00	CARBON	6.8K	5%	1/4W
R418	1-246-467-00	CARBON	560	5%	1/4W
R419	1-246-515-00	CARBON	56K	5%	1/4W
R420	1-246-473-00	CARBON	1K	5%	1/4W
R421	1-246-481-00	CARBON	2.2K	5%	1/4W
R422	1-246-481-00	CARBON	2.2K	5%	1/4W
R423	1-246-489-00	CARBON	4.7K	5%	1/4W
R501	1-246-489-00	CARBON	4.7K	5%	1/4W
R502	1-246-501-00	CARBON	15K	5%	1/4W
R503	1-246-521-00	CARBON	100K	5%	1/4W
R504	1-246-535-00	CARBON	390K	5%	1/4W
R505	1-246-491-00	CARBON	5.6K	5%	1/4W
R506	1-246-521-00	CARBON	100K	5%	1/4W
R507	1-246-497-00	CARBON	10K	5%	1/4W
R508	1-246-505-00	CARBON	22K	5%	1/4W
R509	1-246-505-00	CARBON	22K	5%	1/4W
R510	1-246-497-00	CARBON	10K	5%	1/4W
R511	1-246-509-00	CARBON	33K	5%	1/4W
R512	1-246-515-00	CARBON	56K	5%	1/4W
R513	1-246-501-00	CARBON	15K	5%	1/4W
R514	1-246-497-00	CARBON	10K	5%	1/4W
R515	1-246-521-00	CARBON	100K	5%	1/4W

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- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC··: μPC, UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R516	1-246-505-00	CARBON	22K	5%	1/4W	
R517	1-246-521-00	CARBON	100K	5%	1/4W	
R518	1-246-497-00	CARBON	10K	5%	1/4W	
R519	1-246-497-00	CARBON	10K	5%	1/4W	
R520	1-246-497-00	CARBON	10K	5%	1/4W	
R521	1-246-497-00	CARBON	10K	5%	1/4W	
R522	1-246-497-00	CARBON	10K	5%	1/4W	
R523	1-246-497-00	CARBON	10K	5%	1/4W	
R524	1-246-497-00	CARBON	10K	5%	1/4W	
R525	1-246-489-00	CARBON	4.7K	5%	1/4W	
R602	1-246-521-00	CARBON	100K	5%	1/4W	
R603	1-246-473-00	CARBON	1K	5%	1/4W	
R604	1-246-473-00	CARBON	1K	5%	1/4W	
R605	1-246-473-00	CARBON	1K	5%	1/4W	
R701 ⚠.	1-247-077-00	CARBON	3.3	5%	1/4W	F
R702	1-246-493-00	CARBON	6.8K	5%	1/4W	
R703 ⚠.	1-247-224-00	CARBON	220	5%	1/2W	F
R704	1-246-489-00	CARBON	4.7K	5%	1/4W	
R705 ⚠.	1-247-097-00	CARBON	39	5%	1/4W	F
R706 ⚠.	1-247-137-00	CARBON	1.8K	5%	1/4W	F
R707	1-246-479-00	CARBON	1.8K	5%	1/4W	
R708 ⚠.	1-247-097-00	CARBON	39	5%	1/4W	F
R709	1-246-485-00	CARBON	3.3K	5%	1/4W	
R801	1-247-855-00	CARBON	10K	5%	1/6W	
R802	1-247-839-00	CARBON	2.2K	5%	1/6W	
R803	1-247-867-00	CARBON	33K	5%	1/6W	
R804	1-246-521-00	CARBON	100K	5%	1/4W	
R805	1-247-839-00	CARBON	2.2K	5%	1/6W	
R806	1-247-839-00	CARBON	2.2K	5%	1/6W	
R807	1-247-839-00	CARBON	2.2K	5%	1/6W	
R808	1-247-839-00	CARBON	2.2K	5%	1/6W	
R809	1-247-839-00	CARBON	2.2K	5%	1/6W	
R810	1-247-839-00	CARBON	2.2K	5%	1/6W	
R811	1-247-839-00	CARBON	2.2K	5%	1/6W	
R812	1-247-839-00	CARBON	2.2K	5%	1/6W	
R813	1-247-827-00	CARBON	680	5%	1/6W	
R814	1-247-831-00	CARBON	1K	5%	1/6W	
R815	1-247-855-00	CARBON	10K	5%	1/6W	
R816	1-247-817-00	CARBON	270	5%	1/6W	
R817	1-246-497-00	CARBON	10K	5%	1/4W	
R818	1-246-477-00	CARBON	1.5K	5%	1/4W	
R819	1-246-497-00	CARBON	10K	5%	1/4W	
R820	1-246-481-00	CARBON	2.2K	5%	1/4W	
R821	1-246-481-00	CARBON	2.2K	5%	1/4W	
R822	1-246-497-00	CARBON	10K	5%	1/4W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R823	1-247-855-00	CARBON	10K	5%	1/6W	
R824	1-246-497-00	CARBON	10K	5%	1/4W	
R825	1-246-481-00	CARBON	2.2K	5%	1/4W	
R826	1-246-481-00	CARBON	2.2K	5%	1/4W	
R827	1-246-481-00	CARBON	2.2K	5%	1/4W	
R828	1-247-871-00	CARBON	47K	5%	1/6W	
R829	1-247-855-00	CARBON	10K	5%	1/6W	
R830	1-247-871-00	CARBON	47K	5%	1/6W	
R833	1-246-473-00	CARBON	1K	5%	1/4W	
R834	1-246-497-00	CARBON	10K	5%	1/4W	
R835	1-247-873-00	CARBON	56K	5%	1/6W	
R836	1-247-879-00	CARBON	100K	5%	1/6W	
R837	1-247-863-00	CARBON	22K	5%	1/6W	
R838	1-247-879-00	CARBON	100K	5%	1/6W	
R839 ⚠.	1-247-095-00	CARBON	33	5%	1/4W	F
R840 ⚠.	1-247-139-00	CARBON	2.2K	5%	1/4W	F
R841	1-246-471-00	CARBON	820	5%	1/4W	
R842	1-247-848-00	CARBON	5.1K	5%	1/6W	
R843	1-247-853-00	CARBON	8.2K	5%	1/6W	
R844	1-247-807-00	CARBON	100	5%	1/6W	
R845	1-247-831-00	CARBON	1K	5%	1/6W	
R846	1-246-466-00	CARBON	510	5%	1/4W	
R847 ⚠.	1-206-477-00	METAL	39	5%	2W	F
R848	1-247-879-00	CARBON	100K	5%	1/6W	
R849	1-246-497-00	CARBON	10K	5%	1/4W	
R850	1-246-529-00	CARBON	220K	5%	1/4W	
R851	1-246-473-00	CARBON	1K	5%	1/4W	
R901 ⚠.	1-202-725-00	(US)....SOLID	3.3M	10%	1/2W	
R902	1-246-445-00	CARBON	68	5%	1/4W	
R903	1-246-445-00	CARBON	68	5%	1/4W	
R904	1-246-445-00	CARBON	68	5%	1/4W	
R905	1-246-445-00	CARBON	68	5%	1/4W	
RT101	1-226-237-00	RES, ADJ, CARBON 20K				
RT102	1-226-238-00	RES, ADJ, CARBON 50K				
RT201	1-228-505-00	RES, ADJ, METAL GLAZE 10K				
RT202	1-226-237-00	RES, ADJ, CARBON 20K				
RY901 ⚠.	1-515-421-00	RELAY				
S501	1-554-303-00	SWITCH, KEY BOARD				
S502	1-554-303-00	SWITCH, KEY BOARD				
S503	1-554-303-00	SWITCH, KEY BOARD				
S504	1-554-303-00	SWITCH, KEY BOARD				
S505	1-554-303-00	SWITCH, KEY BOARD				
S506	1-554-303-00	SWITCH, KEY BOARD				
S507	1-554-303-00	SWITCH, KEY BOARD				
S508	1-554-303-00	SWITCH, KEY BOARD				
S509	1-554-303-00	SWITCH, KEY BOARD				

NOTE:

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- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description
S510	1-554-303-00	SWITCH, KEY BOARD
S511	1-554-303-00	SWITCH, KEY BOARD
S512	1-554-303-00	SWITCH, KEY BOARD
S513	1-554-303-00	SWITCH, KEY BOARD
S514	1-554-303-00	SWITCH, KEY BOARD
S801	1-554-303-00	SWITCH, KEY BOARD
S802	1-554-391-00	SWITCH, SLIDE
S901	⚠ 1-553-318-00	(E)....SWITCH, PUSH (AC POWER)
S901	⚠ 1-553-319-00	(US)...SWITCH, PUSH (AC POWER)
S902	1-552-430-00	SWITCH, SLIDE
T101	1-235-069-00	ENCAPSULATED COMPONENT (B.E.F)
T301	1-405-927-00	COIL, MW OSC
T302	1-405-914-00	COIL, LW OSC
X101	1-527-476-00	OSCILLATOR, CERAMIC
X401	1-527-731-00	OSCILLATOR, CRYSTAL
X801	1-527-532-00	OSCILLATOR, CERAMIC

NOTE:

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CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

9-951-080-11
(with RM-V70)

Sony Corporation
Consumer Products Group
Technical Support Dept.

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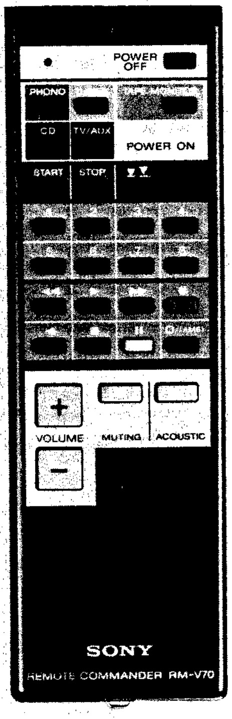
RM-V70

AEP Model
UK Model
US Model
E Model


POWER OFF
PHONO
CD
TV/AUX
POWER ON
START
STOP
VOLUME
MUTING
ACOUSTIC
SONY
REMOTE COMMANDER RM-V70

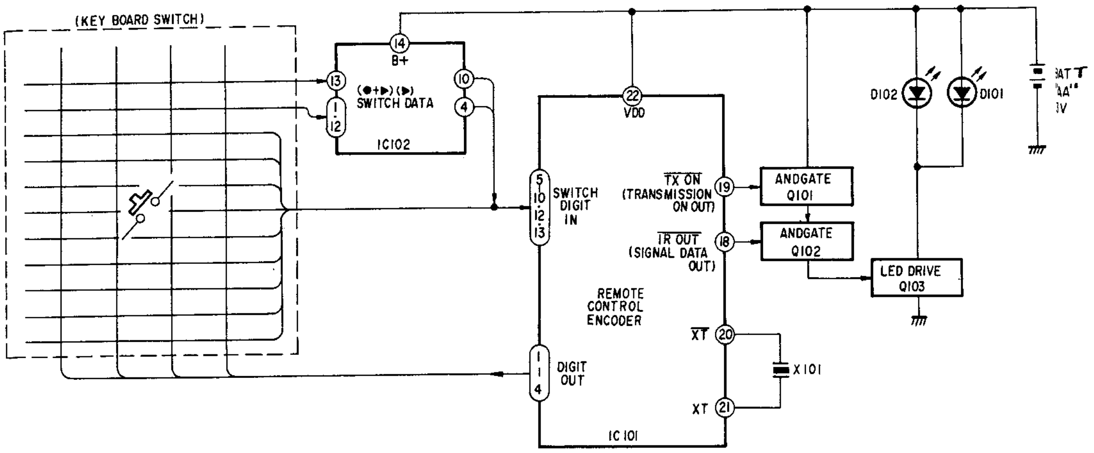
REMOTE COMMANDER

SPECIFICATIONS

Power consumption	3 V dc with two batteries IEC designation R6 (size AA)
Remote control system	Infrared control
Dimensions	Approx. 55 × 25 × 175 mm (w/h/d) (2¹/₈ × 1 × 6⁷/₈ inches)
Weight	Approx. 125 g (4 oz)

1. OUTLINE

1-1. BLOCK DIAGRAM


(KEY BOARD SWITCH)
14
B+
13
1
12
(●+▶) (▶)
SWITCH DATA
10
4
IC102
22
VDD
5
10
12
13
SWITCH DIGIT IN
TX ON (TRANSMISSION ON OUT)
19
IR OUT (SIGNAL DATA OUT)
18
REMOTE CONTROL ENCODER
XT
20
XT
21
X101
1
4
DIGIT OUT
IC101
ANDGATE Q101
ANDGATE Q102
LED DRIVE Q103
D102
D101
BATT
"AA"
3V

MICROFILM

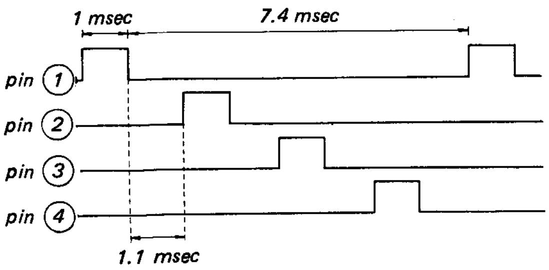
SONY®

SERVICE MANUAL

1-2. SWITCH DATA INPUT

When the commander key switch is not pressed, the clock generator of remote control encoder IC101 turns off and the IC is initialized. When the key switch goes ON, the clock generator operates.

When the clock generator operates, a pulse is output to the digit output pins ① – ④ , and each switch data is read into pins ⑤, ⑥, ⑦, ⑧, ⑨, ⑩ , ⑫ , and ⑬ by the key switch matrix.



Read in of Recording (● + ▶) Switch Data

When the key switches ● and ▶ go ON at the same time, the pulse from pin ① is input to gate input pins ⑬ and ⑫ of IC102. The inverted pulse is output to output pin ⑪ (gate input ⑧ and ⑨). The pulse from pin ⑩ is input to pin ⑫ as recording switch data via the inverter.

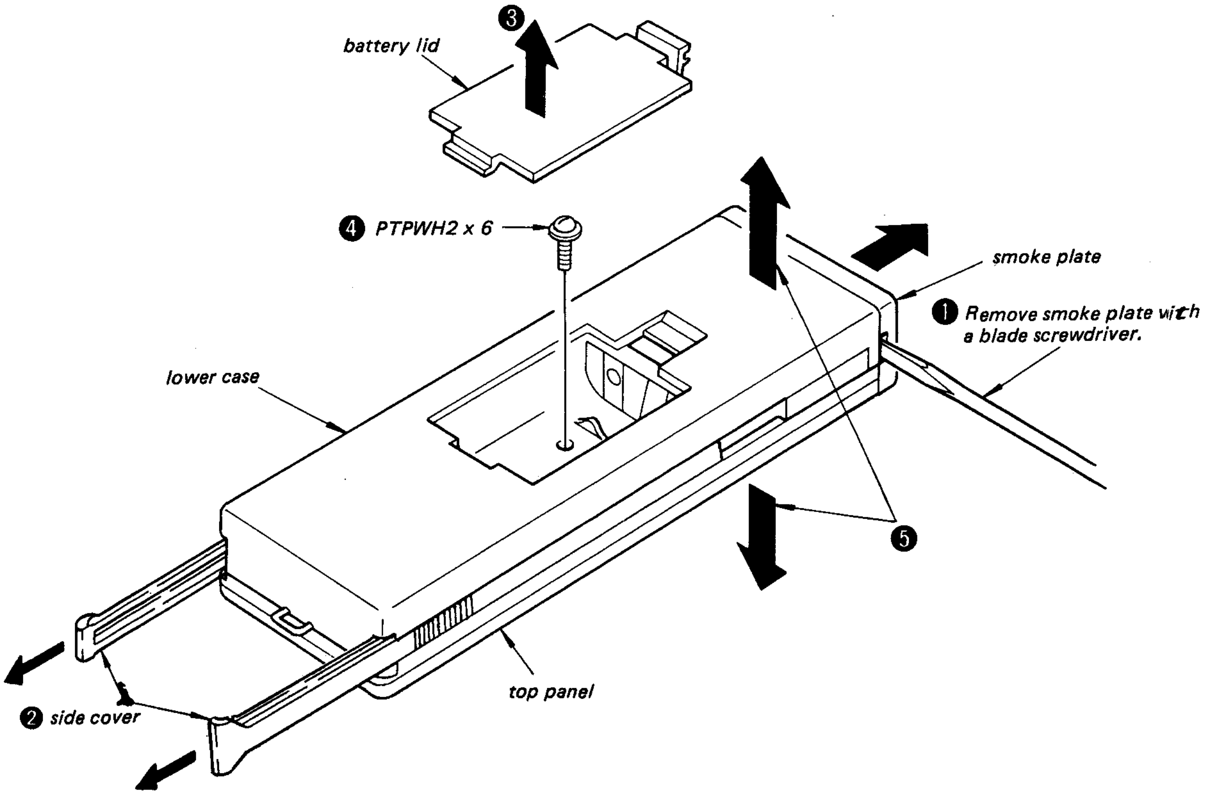
When only the key switch ● goes ON, the pulse is input to gate input pin ⑬ of IC102 only. As gate input pin ⑫ is "L" level, output pin ⑪ goes high and output pin ⑩ goes low regardless of the input pulse of pin ⑬ , so recording switch data is not input.

Read in of Playback (▶) Switch Data

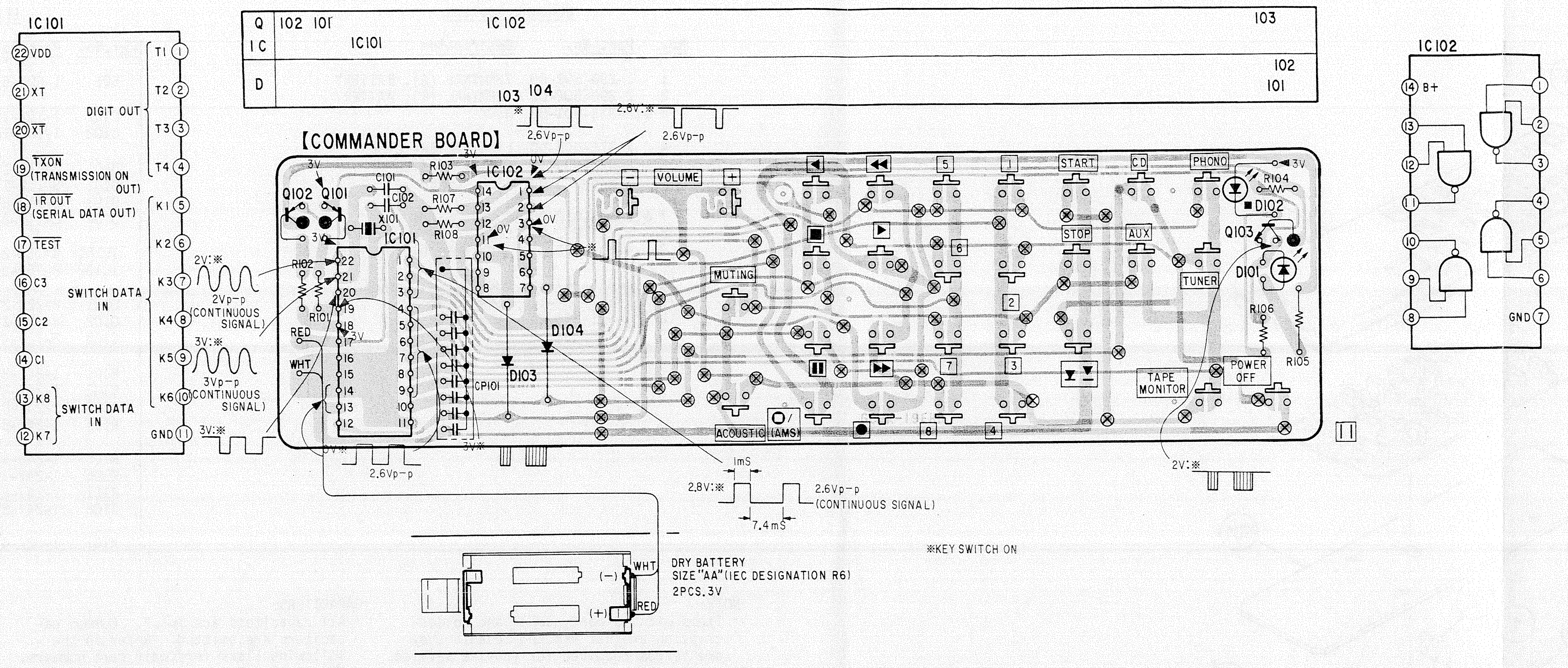
When the key switch ▶ goes ON, the pulse is input to pin ① of IC102. As pin ⑬ of IC102 is "L" level, output pin ⑪ goes high and gate input pin ② goes high. The pulse of pin ① is output to pin ③ as an inverted pulse. The pulse from pin ④ is input to pin ⑩ as playback switch data via the inverter.

2. DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.



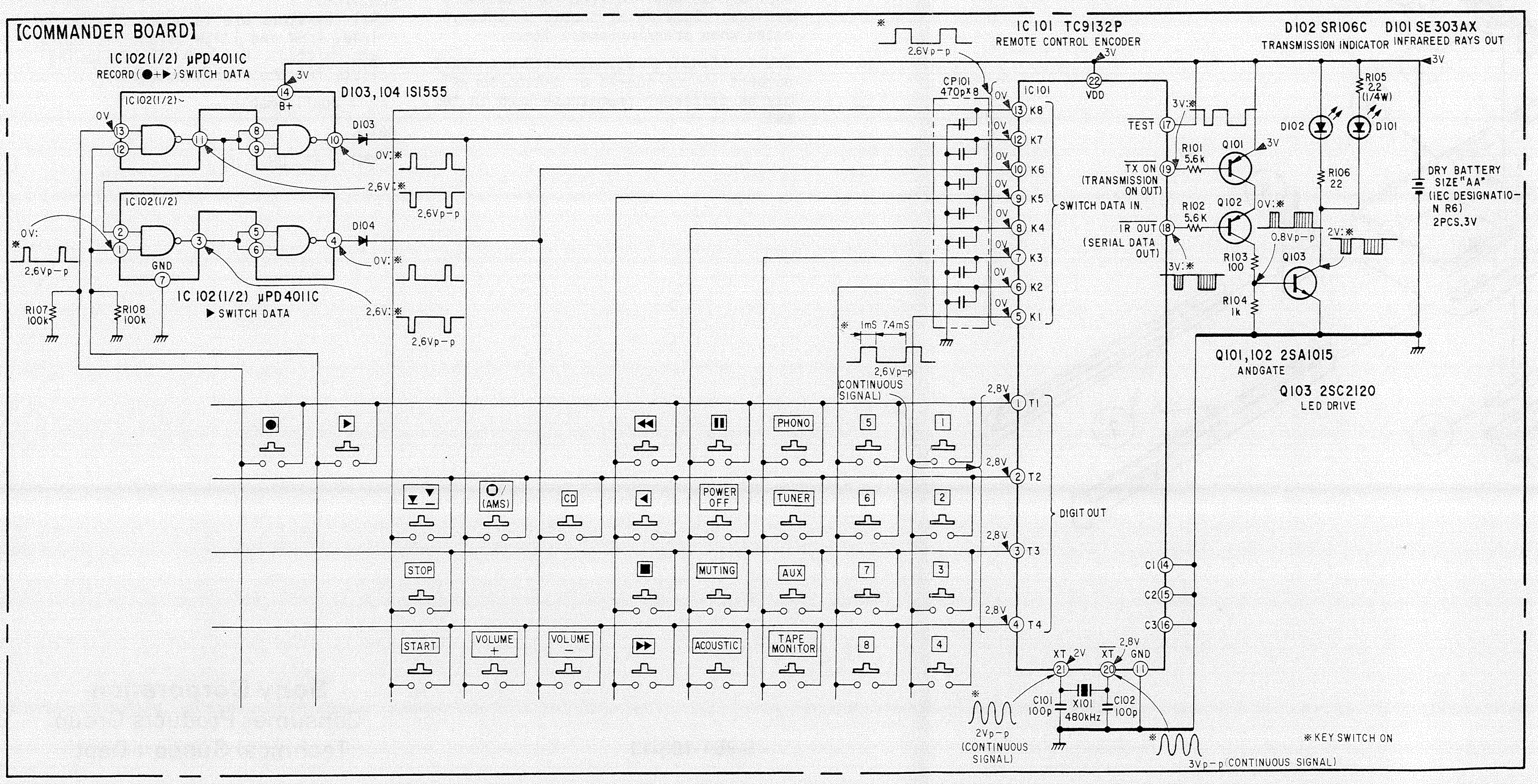
3. MOUNTING DIAGRAM


IC101
22 VDD
21 XT
20 XT
19 TXON (TRANSMISSION ON OUT)
18 IR OUT (SERIAL DATA OUT)
17 TEST
16 C3
15 C2
14 C1
13 K8
12 K7
DIGIT OUT
T1
T2
T3
T4
SWITCH DATA IN
K1
K2
K3
K4
K5
K6
GND
2V:※
2Vp-p (CONTINUOUS SIGNAL)
3V:※
3Vp-p (CONTINUOUS SIGNAL)
3V:※
Q
IC
D
102 101
IC102
IC101
103
104
102
101
2.8V:※
2.6Vp-p
[COMMANDER BOARD]
Q102 Q101
C101
C102
X101
R103
R107
R108
R102
R101
RED
WHT
CP101
D104
D103
VOLUME
MUTING
ACOUSTIC
(AMS)
START
STOP
CD
AUX
PHONO
TUNER
TAPE MONITOR
POWER OFF
Q103
D101
D102
R104
R105
R106
2V:※
1mS
2.8V:※
2.6Vp-p (CONTINUOUS SIGNAL)
7.4mS
DRY BATTERY SIZE "AA" (IEC DESIGNATION R6) 2PCS. 3V
※KEY SWITCH ON
IC102
14 B+
GND 7

Note:

- ⊗ : Through hole.
- ▨ : component-side pattern.
- ▨ : B + pattern

4. SCHEMATIC DIAGRAM

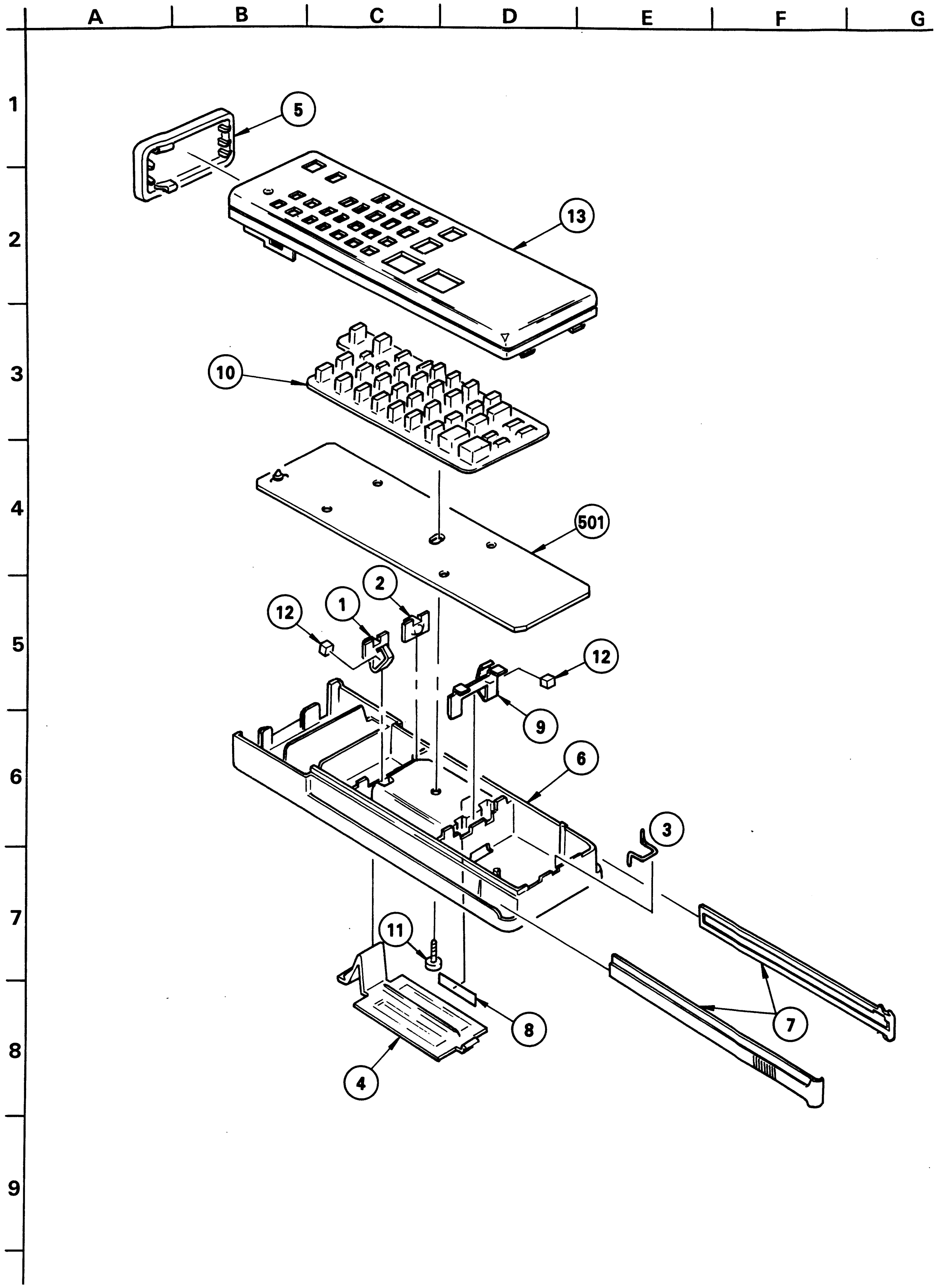

[COMMANDER BOARD]
IC102(1/2) μPD4011C
RECORD (●+▶) SWITCH DATA
D103, 104 1S1555
IC102(1/2)
IC 102(1/2) μPD4011C
▶ SWITCH DATA
R107 100k
R108 100k
2.6Vp-p
IC101 TC9132P
REMOTE CONTROL ENCODER
CP101 470p×8
VDD
TEST
TX ON (TRANSMISSION ON OUT)
SWITCH DATA IN
IR OUT (SERIAL DATA OUT)
D102 SR106C
TRANSMISSION INDICATOR
D101 SE303AX
INFRAREED RAYS OUT
R105 2.2 (1/4W)
R101 5.6k
R102 5.6k
R103 100
R104 1k
R106 22
DRY BATTERY SIZE "AA" (IEC DESIGNATION R6) 2PCS. 3V
Q101, 102 2SA1015
ANDGATE
Q103 2SC2120
LED DRIVE
1mS 7.4mS
2.6Vp-p (CONTINUOUS SIGNAL)
DIGIT OUT
T1
T2
T3
T4
C1
C2
C3
PHONO
POWER OFF
TUNER
MUTING
AUX
TAPE MONITOR
ACOUSTIC
STOP
START
VOLUME +
VOLUME −
CD
(AMS)
C101 100p
X101 480kHz
C102 100p
2Vp-p (CONTINUOUS SIGNAL)
3Vp-p (CONTINUOUS SIGNAL)
※KEY SWITCH ON

Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/6 W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ——: B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM.
- Voltage variations may be noted due to normal production tolerances.

Note: Voltages are measured with a VOM (50kΩ/V).

5. EXPLODED VIEW AND PARTS LIST



GENERAL SECTION

No.	Part No.	Description
1	2-290-601-00	TERMINAL (A), BATTERY
2	2-290-602-00	TERMINAL (B), BATTERY
3 ♠;	2-375-001-00	HOOK
4	2-375-003-00	LID, BATTERY CASE
5	2-375-004-00	PLATE, FROSTED
6	2-375-008-00	CASE, LOWER
7 ♠;	2-375-013-00	COVER, SIDE
8	3-701-999-00	LABEL, SERIAL NUMBER
9	4-350-925-00	TERMINAL (C), BATTERY
10	4-886-947-00	RUBBER (L), CONTACT
11	7-687-204-11	PTPWH 2X6
12	9-911-845-XX	CUSHION
13	X-4886-908-0	PANEL ASSY, TOP

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
501	1-609-570-00	PC BOARD; REMOTE CONTROL			
C101	1-102-106-00	CERAMIC	100PF	10%	50V
C102	1-102-106-00	CERAMIC	100PF	10%	50V
D101	8-719-193-03	DIODE SE303AX			
D102	8-719-100-06	DIODE SR106C			
D103	8-719-815-55	DIODE 1S1555			
D104	8-719-815-55	DIODE 1S1555			
IC101	8-759-200-00	IC TC9132P			
IC102	8-759-984-11	IC MB84011B			
Q101	8-729-201-52	TRANSISTOR 2SA1025			
Q102	8-729-201-52	TRANSISTOR 2SA1025			
Q103	8-729-413-10	TRANSISTOR 2SC1475			
R101	1-247-849-00	CARBON	5.6K	5%	1/6W
R102	1-247-849-00	CARBON	5.6K	5%	1/6W
R103	1-247-807-00	CARBON	100	5%	1/6W
R104	1-247-831-00	CARBON	1K	5%	1/6W
R105	1-246-409-00	CARBON	2.2	5%	1/4W
R106	1-247-791-00	CARBON	22	5%	1/6W
R107	1-247-879-00	CARBON	100K	5%	1/6W
R108	1-247-879-00	CARBON	100K	5%	1/6W
X101	1-527-476-00	OSCILLATOR, CERAMIC			

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